The·Northwestern·Miller

MILLING PRODUCTION SECTION

IN TWO SECTIONS—SECTION TWO

APRIL 11, 1945

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Volume 222 • Number 2

Sp. 654
No. 36-VITAMIN MIXTURE
for Flour Enrichment
SINGLE STRENGTH
Each ounce contains: 380 mg. Thiamine (Vitamin B1)
230 mg. Riboflavin (Vitamin B2)
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2400 mg. Iron by Hydrogen
The balance is starch
One-half (½) ounce of this Vitamin Mixture added to each 100 lbs. of flour will add to each pound of flour the following: 1.90 mg. Thiamine, 1.15 mg. Riboflavin, 13.70 mg. Niacin, and 12.00 mg. Iron.
This rate of addition to the flour pre-supposes the flour itself to contain per pound a minimum of 0.40 mg. Thiamine, 0.08 mg. Riboflavin, 2.30 mg. Niacin, and 1.00 mg. Iron.
If necessary, adjustment should be made in the feed rate indicated above to meet variations in the natural vitamin and Iron contents of the flour. It is considered good operating practice to add enrichment ingredients in an excess up to 10% over the calculated required quantity.
Minimum Federal Requirements for "Enriched Flour" per Pound:
2.0 mg. Thiamine
1.2 mg. Riboflavin
16.0 mg. Niacin
13.0 mg. Iron
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Each ounce contains: 760 mg. Thiamine (Vitamin B1)
460 mg. Riboflavin (Vitamin B2)
5480 mg. Niacin
4800 mg. Iron by Hydrogen
The balance is starch
One-quarter (¼) ounce of this Vitamin Mixture added to each 100 lbs. of flour will add to each pound of flour the following: 1.90 mg. Thiamine, 1.15 mg. Riboflavin, 13.70 mg. Niacin, and 12.00 mg. Iron.
This rate of addition to the flour pre-supposes the flour itself to contain per pound a minimum of 0.40 mg. Thiamine, 0.08 mg. Riboflavin, 2.30 mg. Niacin, and 1.00 mg. Iron.
If necessary, adjustment should be made in the feed rate indicated above to meet variations in the natural vitamin and Iron contents of the flour. It is considered good operating practice to add enrichment ingredients in an excess up to 10% over the calculated required quantity.
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MERCK & CO., Inc. • RAHWAY, N. J.
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★ Merck also offers No. 36P—Vitamin Mixture. This is identical in composition with No. 36 Vitamin Mixture, except that in place of Iron by Hydrogen, Sodium Iron Pyrophosphate is used.

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Producing Insect-Free Flour

By Dr. R. T. Cotton

THE production of insect-free flour is no longer something merely to be desired. It is necessity. Bakeries and other concerns handling flour have found that it is unsafe to accept flour that is contaminated with insects, and will reject shipments that show signs of infestation. They will no longer be satisfied with the oft-repeated statement that freshly milled flour cannot contain insects or insect eggs because every particle is sifted through silk cloths fine enough to prevent the passage of insect life. The truth is that flour when it is packed, often does contain insect life in one form or another. The reasons for this infestation in freshly packed flour and adequate methods for its prevention are so well understood that there is no longer any legitimate excuse for producing anything but insect-free flour.

ABOUT THE AUTHOR

Dr. Cotton, author of this article, is senior entomologist, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture.

He is in charge of a laboratory located at Manhattan, Kansas, and the major portion of the research conducted at the laboratory deals with problems associated with insect infestation in whole and processed grains and infestation in food processing plants.

Dr. Cotton is a recognized leader in his field of research and has made many significant contributions to the knowledge in that field.

CAUSES OF INFESTATION IN FRESHLY PACKED FLOUR

The chief causes of infestation in freshly packed flour are (1) the presence of a heavy insect population in the flour mill, (2) the practice of using clear and low-grade or returned flours in blending operations without proper treatment to remove and destroy insect life, and (3) the lack of adequate redressing equipment or its improper location in the mill.

Insect Populations in the Mill

The existence of a heavy insect population in the flour mill is the most important cause of infestation in freshly milled flour. Although flour, in the course of manufacture, is bolted through cloth fine enough to remove all stages of insect life (fig. 1), breaks in bolting cloths occur which allow insects to slip through and establish infestations in the flour-collecting conveyors. Furthermore, in the course of inspecting and repairing sifter sieves, infested stock is often allowed to drop into the conveyors below. If the mill is heavily infested, the chances that insects will get by the sifters through breaks in the cloths or during repair operations are greatly increased.

Observations have demonstrated that the insect population in the average mill is high throughout the greater part of the year. Although conditions are most favorable for them during the summer, insects find an abundance of food and almost ideal breeding conditions at all times. Many mills depend upon a single general fumigation a year to control their insect populations. Few fumigations are entirely effective, however, and after 5 to 12 weeks the insect population may again reach serious proportions. Contributions to this build-up come from insects surviving the fumigation, from those introduced with the grain stream or in returned second-hand bags, or from infested flour or feeds stored in the mill near the machinery.

Blending Operations

The demand for blended flour by large bakeries necessitates the use by mills of large quantities of clear and low-grade flours, which may be obtained in part from other mills and in part from their own warehouses. Usually these flours have accumulated over a period of time and, being highly susceptible to insect attack, are frequently infested. The use of such stocks for blending is oftentimes one of the most serious causes of infestation in finished flour and in the milling machinery handling them.

Returned flours are always a problem to the miller. Formerly it was the custom to feed these flours back into the mill and to incorporate them into one of the many blends required. If these flours are infested, as is usually the case, the same difficulties are experienced as with clear or low-grade flours.

Stock intended for blending should first be examined to determine whether or not it contains insect excrement or is heavily infested. Insect excrement in flour cannot be removed by any practical rebolting process, and flour that contains or has contained an appreciable infestation is considered to be unfit for human consumption. Such flour should be diverted to feed. Methods for detect-

Fig. 3—Shown above is a picture of adults, larvae and pupae of the confused flour beetle.

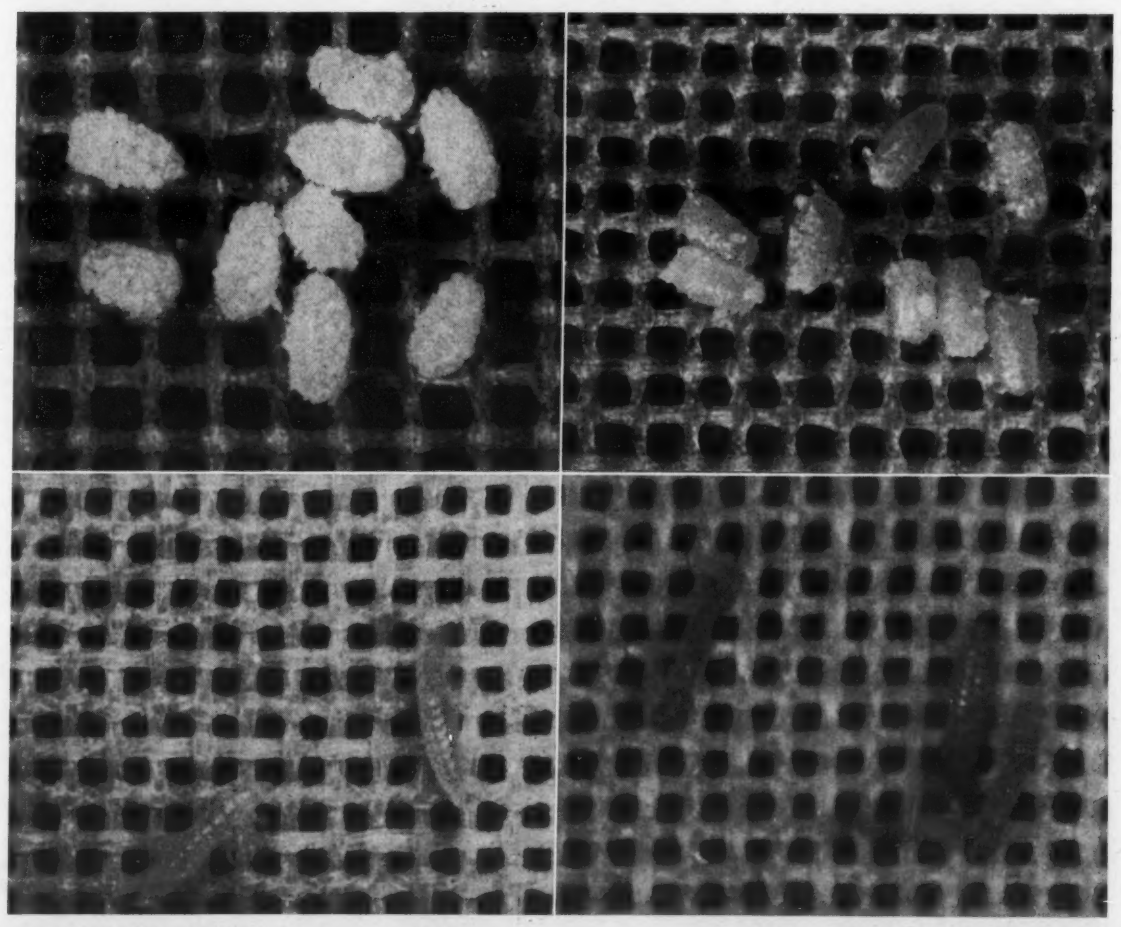

Fig. 1—Above, left, eggs of the confused flour beetle on 5XX bolting cloth; right, eggs of the Mediterranean flour moth on 8XX cloth. Below, one-day-old larvae on 9XX cloth; those on the left are confused flour beetle; those on the right are Mediterranean flour moth. The insects in the stages shown can be removed from flour by the bolting cloths specified. A 10XX cloth, however, is required to remove larvae and eggs of some of the other species of insects that infest flour. The cloths should be inspected frequently for large holes.

ing insect filth in flour are described in Food and Drug Circular No. 1, Microanalysis of Food and Drug Products, Appendix XV (1944), issued by the Federal Security Agency.

Redressing Equipment

It is customary to redress such flours prior to blending. Reels are most commonly used for this purpose, but they are seldom equipped with bolting cloth fine enough to prevent the passage of eggs and small larvae, and because of their construction cannot be relied upon to remove all insect life. If the finished flour were redressed after blending there would be little danger from this source. Owing to the limited capacity of redressing machinery, however, this operation is often omitted, and flour for blending is introduced into the mixing conveyor leading directly to the packer bins. With such a system the probability of infestation in the finished flour is great.

KEEPING THE INSECT POPULATION AT A LOW LEVEL

The possibility of holding the insect population of a flour mill at a low level throughout the year has been the subject of considerable research. By the proper combination of good housekeeping methods and general and local fumigations, insect infestations can be reduced to and held at a safe level for an indefinite period. Additional precautions include treatment of the grain stream and flours, used for blending and proper care of returned bags and stored feed.

General Fumigation of the Mill

At least one general fumigation, but preferably three, annually with hydrocyanic acid, methyl bromide, or chloropicrin should be scheduled, and supplemented with local fumigation each month of all milling units containing accumulations of stock. For local fumigation work both chloropicrin and the 3:1 mixture of ethylene dichloride and carbon tetrachloride are useful. Complete information regarding both general and local fumigation methods, and the precautions to be observed in the use of these materials, are contained in U. S. Department of Agriculture Circular 369, "Industrial Fumigation Against Insects," and Circular 390, "Flour Mill Insects and Their Control" (both revised in 1937).

Good Housekeeping

The removal of prevention of accumulations of milling stock in any part of the flour mill should be made one of the most important phases of the insect-control program. Insects will breed in any accumulations of flour that are permitted to remain undisturbed. It should be the duty of some of the personnel to study the mill and determine how best to eliminate danger spots.

Unused conveyors, slide spouts, or any piece of unused equipment in which flour collects should be eliminated. Many pieces of milling equipment rest on the floor in such a way that flour dust collects between them and the floor. Since it is practically impossible to clean such places, they provide ideal breeding places for insects. Whenever possible such equipment should be raised far enough above the floor to allow easy and frequent cleaning. This applies particularly to elevator boots, since not only do they harbor insects underneath them, but also are readily accessible to insects crawling about on the floor. It is a simple matter for insects to crawl from one heavily infested elevator boot to one carrying clean stock. By rounding the bottoms of elevator boots the accumulation of milling stock can be reduced in some cases as much as 80%.

Treating the Grain Stream

Grain-cleaning machinery is often located close to the milling units, and the screenings are spouted to a collecting sack located near milling machinery or stored finished flour. Grain-cleaning machinery should be segregated in a smut room at one end of the mill, and screenings should be immediately spouted to a screenings hammermill, a centrifugal machine, or to a vault where they can be fumigated or sterilized by heat. Grain screenings should never be allowed to accumulate in the mill or flour warehouse.

If a quick temper process employing steam is used, any insects surviving the cleaning process can be destroyed by heat. Centrifugal machines (fig. 2) can also be used for destroying insects in the grain stream. Tests have shown that, when wheat is run through a centrifugal machine operated at a speed of 1,750 rmp, more than 99% of the free living insects in the grain are killed without serious breakage of the wheat berries.

Wheat after it is tempered may be treated by a centrifugal machine operated at the standard speed of 3,500 rmp provided a 12-inch rotor is used. At this speed all weak and infested kernels will be broken. If the treatment is followed by a strong aspiration, dirt, beeswing and fragments of insects killed or dislodged from the broken kernels are removed. If desired the stock can then be classified according to size and distributed to the appropriate roll.

Fig. 2—The picture above shows a battery of centrifugal machines for the destruction of all forms of insect life that might be present in flour.

Bags should be stacked in small piles with plenty of room between the piles for ample air circulation.

Treating Used Bags

Used bags constitute a source of infestation in the mill that is often overlooked. On arrival at the mill they are too likely to be thrown into the bag room, or a corner of the mill or warehouse, where they serve as a constant source of infestation. Prior to refilling they are usually run through a bag cleaner or are cleaned by some type of air suction. These methods seldom remove all stages of flour-infesting insects, and fresh flour packed in them may become heavily infested if held in storage for any appreciable time. The infested material removed from the bags by the cleaning process, unless immediately disposed of, provides an additional source from which infestation can spread.

Unless used bags have been laundered, they should be received in a room or building separate from the mill or storage warehouse, where they can be fumigated or sterilized by heat.

Storing Feeds in the Mill or Flour Warehouse

The custom of storing certain feeds in the mill or flour warehouse during periods when such feeds accumulate is extremely common. Because it is impossible to sift them through screens fine enough to remove insect life, feeds are seldom entirely free from insect infestation. If they are stored near flour or milling machinery, it is sure to become infested by insects migrating from these products.

All insect life in feeds can be killed by running them through a centrifugal machine, but until mills are equipped to handle them in this way all feeds should be stored in a separate warehouse located as far as possible from the mill and flour warehouse. Many of the insect pests of flour and feed are strong fliers so that it is not possible to prevent insects from migrating from feed to flour merely by storing them in different sections of the same warehouse.

Treating Flour Used for Blending

Flour intended for blending should be run through a reel and then through a centrifugal machine, or it should be bolted through a redress sifter equipped with 10XX bolting cloth. If the latter method is used, the overs should be spouted directly to feed, and care must be exercised to see that there are no breaks in the silk cloths to allow insects to slip through and become established in the flour conveyors beyond. Returned flours intended for blending should be treated in the same manner.

REDRESSING FINISHED FLOURS

In spite of all precautions that are taken to prevent insects from getting into the finished flour, they do occasionally become established in the flour conveyors, elevator boots, bleaching machinery, and other equipment that handle the flour between the main bolters and the packer bins. To prevent the possibility of any flour being packed out with any stage of insect life in it, some additional treatment must be given just before it passes to the packer bins.

Some type of redressing machinery has long been in use for the removal of caked flour or foreign material that has been accidentally incorporated in the flour during manufacture. Formerly this redressing machinery, consisting of reels or sifters, was equipped with relatively coarse cloth, to speed the processing of the

(Continued on page 8a.)

Protein Production by Plants

By Dr. W. A. Albrecht
Chairman, Department of Soils
University of Missouri

THE lowered concentration of protein in the wheat crop of 1944 has been the signal for considerable discussion. This was given impetus by a shift in the specifications for the protein concentration of flour when the War Food Administration announced that the minimum figure was set at 10.25% as compared to 11%, which was the corresponding figure for the previous years.

This reduction in the specifications is not without its reverberations in the minds of the millers and bakers when their operations in processing wheat into flour and bread are geared so completely to complex mechanisms, seemingly too rigid to permit a little shift in flour quality.

Some among those concerned with wheat quality have given thought to what determines the concentration of protein in wheat. In facing this question, the common custom of ascribing it to the weather has been a ready mental escape from it or a nonchalant dismissal in the absence of more searching consideration of it.

But protein production by plants depends mainly on the chemical elements of fertility coming from the soil in contrast to the dependence of starch or carbohydrate production on elements contributed by rainfall and air, or in other words, the weather. Moreover, high wheat yields under liberal rainfalls for the past three or four years have been rapidly exploiting the soil fertility so readily mobilized by abundant moisture. Recognizing these forces, should we not also bring into the discussion the possibilities of (a) lowered total delivery of soil fertility, (b) less properly balanced combinations of it, or (c) improperly timed supplies in relation to the crop's particular physiological service by it? Isn't it about time that we consider managing the fertility of our soils with food quality in mind as well as mining them continually for maximum production of bulk only?

Moisture Is Not So Directly Responsible for the Crop

Any crop is the result of the weather and the soil, two complex factors, of which the first is beyond man's control, while the second yields to the skill of his husbandry. But it takes so much rainfall and so little from the body of the soil to make a crop! Likewise it is so easy to note differences in the weather and so difficult to evaluate differences in the soil as they affect the plant body. Consequently, one can readily understand why the weather is so quickly considered the common control of the yield that is measured as bulk and likewise of the quality that registers itself, for example, only as protein concentration in the wheat grain.

When the soil itself is only a temporary rest stop of rocks while the climatic forces of rainfall and temperature are dividing and hustling them off to the sea, we are prone to believe the weather and not the rocks determine both the quantity and the quality of the crop. We are not so ready to see that, first, the climate makes the soil, and that second, the soil, by its control of how well the crop is fed, determines how much of crop and what quality of crop are produced. Both of these aspects of a crop are more apt to be controlled by how well the plants are fed than by how wet or dry, or how cold or warm, they are.

Our failure to understand many of the details by which soils feed the plants has kept the soil fertility aspect out of the explanations of plant behaviors. This failure has put weather, especially rainfall, into prominence as the controlling factor in crop yield and in the particular crop quality, like protein concentration in the wheat.

Of course rainfall is a factor in making the crop, but so is the fertility of the soil that determines through nutritional influence how effectively that rainfall will serve. At the same time the meteorological forces are taking moisture from the plant and thereby from the soil. Only relatively small amounts of it are built into the body of the plant. Large amounts are transpired in keeping the leaf tissues moist, just as we exhale much moisture from the lungs. Shall we continue in confusion by thinking of moisture of transpiration as if it were in control of, or controlled by, plant nutrition? Is the degree of frostiness on our breath a matter of the liquid potion taken for breakfast? The transpiration rate is not a measure of growth rate, and water loss is too often a liability on account of fertility shortage when we believe it an asset in growth. The rainfall is used most efficiently with liberal fertility present. It is the climate that either provides or removes the latter. The rainfall therefore enters into crop control not directly but indirectly by way of soil fertility.

Differences in rainfall, in soil fertility and in protein concentration are apt to be confused in their causal connections. That the bushels per acre are not entirely a matter of the amount of rainfall is clearly shown by the fact that recently, with only 20 inches of annual rainfall, the region formerly known as the Dust Bowl has had areas with yields of 40 bus of wheat per acre. Missouri, with 40 inches of annual rainfall, would be doing well to get an average yield of half that much. It is a common concept that more rainfall means more crop yield. This is the truth in terms of the bulk of vegetation produced. It is well illustrated as one comes from western Kansas with its short grass area in the belt of 20 inches of annual rainfall and moves eastward to the former tall grass or big bluestem region of eastern Kansas and the more eastern prairie states. While the production in total bulk of vegetation or grains per acre is going up in this traverse eastward, the quality in both vegetation and grain as complete and efficient sustenance for animal and human life is going down.

In wheat, as a single crop covering this entire stretch of wide climatic variations from west to east across the midlands of the United States, the percentage of protein in the grain goes down as we move from low annual rainfall to higher annual precipitation. While pointing only to the fact that protein, which is such an essential for body growth of higher animals, is going down as percentage of the grain, we have not been emphasizing the fact that the carbohydrate, which serves mainly as fuel and fattening for higher animals, has been going up as component of the grain. Nor have we pointed to the fact that within that same grain the various nutrient elements of distinctly mineral origin in the soil have also been going down in concentration at a relatively more rapid rate than the protein concentration has been falling.

So oblivious have we been to this fact of the plant's chemical composition being related to the soil, that when the wheat grain increases its ash content to the point of putting more than 0.5% of this into the flour milled therefrom, we are prone to accuse the miller of getting "dirt" into his product during the milling process. We are about to realize that it is the more fertile soil giving this higher mineral content.

In the variations in the yield and the quality of wheat the variations in the rainfall have not been consistent with them to make the rainfall stand out as a causal factor. More rainfall gives more vegetative bulk as one goes eastward, yet with a constant amount of rainfall across that area there is an increasing grain yield while going in the opposite direction. The straw output is not necessarily commensurate with it. Surely the differences in plant nutrition, in terms of what the plants find to eat in the soil rather than of the amount they drink from the heavens, are at the control of the plant behaviors in their ecological array. We must call into this picture of composition of the grain of wheat—variable along the lines of latitude—some other causal factors beside the difference in annual rainfalls. We must examine the soil fertility, the other of the natural factors that contribute to the yield and to the quality of the crop.

Climate and Soil Fertility

The climatic forces of the United States serve to illustrate clearly the wide range in fertility of our soils. By going from west to east one can go from the desert with almost no rainfall and consequently no significant soil development to annual precipitations of 60 inches with decidedly destructive action and leaching effects on the soil. The rainfall map outlines clearly, in the western half, the longitudinal belts of increasing rainfall as one goes eastward. In the eastern half, the delineations are more nearly latitudinal with demarcations to give a north and a south. Here with the much higher rainfall, the higher temperatures too become more pronounced in their effects on the soil.

It is important to note the particular rainfall belt into which wheat is ecologically fitted. This crop is not so commonly found at high production either as to yield or quality where the soil has undergone excessive development, or chemical breakdown and subsequent serious leaching. Rather, the wheat grain that is so commonly recognized as the main ingredient of the staff of life is located the world over in regions of moderate rainfall. It gives its maximum concentration of protein and conversely its minimum concentration of carbohydrate as it is produced in regions of the more hazardous or lesser annual rainfalls.

(Continued on page 11a.)

About the Author

Dr. Albrecht, author of this article, was invited to present his views on factors that influence the protein content of wheat. Other articles dealing with that general topic were published in September and November, 1944. Those discussions were prepared by Dr. C. O. Swanson, Kansas State College, and Dr. M. A. McCall of the Bureau of Plant Industry, U. S. Department of Agriculture.

The viewpoints of Dr. Albrecht differ in some respects from the viewpoints expressed by Drs. Swanson and McCall. Dr. Albrecht's discussion is presented herewith and merits serious consideration by those interested in the whole problem.

Bags—an Implement of Victory

WE are accustomed to agree that in war food is virtually a bullet. Why should not bags be granted the same similitude? Many another thing will clamor, with justice, to be recognized as war-essential. Let them speak, too, if they will. But bags can make a very special case for themselves, and that is the object of this story.

Let us begin with the basic reason. Free movement and uninterrupted supply of farm products and food is accepted as essential to successful prosecution of the war and to the health and well-being of the armed forces and civilian population. An unbroken chain of production, handling and transportation is essential to such movement and supply. Bags provide one of that chain's most essential links. It must not be broken.

The chain has not been broken. Early in 1941 the textile bag industry took cognizance of the danger of a shortage of burlap, and later of cotton textiles, developing into a shortage of bags to handle the agricultural and food products of the country. Paper in its turn came into the picture and shares in the wise provision and ultimate accomplishment.

Aggressive efforts in the early period of the problem, made in co-operation with the U. S. Department of Agriculture, the Maritime Commission and various other government agencies, resulted in forestalling a threatened shortage of textile bags. Careful and extensive surveys were begun at that time and since have been expanded, revised and refined into a continuing program of statistical reporting, which gives a current and comprehensive picture of bag consumption and raw material requirements, currently and projected into the future.

The great majority of all members of the new textile bag industry participate in and co-operate with this program. It provides the factual information with respect to supply and demand which enables government intelligently to direct and control the flow of raw materials needed for maintenance of supplies of bags essential to the production and handling of agricultural and food supplies of the country and their distribution to our armed forces and civilian population.

Committees were formed and individuals selected from within the industry early in 1941 to maintain consistent liaison and helpful co-operation with all government departments and officials concerned, directly or indirectly, with maintenance of supplies.

A committee of technical experts also was formed to co-operate with our armed forces, lend-lease and other government departments in the development of most suitable containers for each specific purpose and commodity, particularly for overseas shipments. This committee has continued to function most effectively, conducted extensive trials and performance tests and its members have unselfishly devoted their time and attention to its activities, frequently at the expense of their individual connections and interests.

This likewise applies to such committees as the cotton goods supplies committee, the burlap supplies committee, the sandbag committee appointed at the request of the Army, and the textile bag ceiling price committee, later supplanted by the textile bag industry advisory committee to the OPA. These committees, together with government-appointed industry advisory committees, formed a complete liaison and working combination between government and industry.

The secretary of the Textile Bag Manufacturers Association has acted continuously as statistical consultant and appraiser of

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An Editorial "E" Award

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factual information to the various committees and to government officials concerned.

Committees and individuals from within the industry have instigated and actively cooperated with government officials in programs of conservation through various means, such as (a) Simplification and reduction in the number of types and constructions of cloth used for bags; (b) promotion and encouragement of the reuse of textile bags as many times as possible; (c) publication and distribution of booklets to bag using trades containing full detailed information as to how to handle and use textile bags in such a way as to extend their effective life and greatest possible reuse; (d) printing and wide distribution of large sized colored conservation posters urging fullest possible utilization of textile bags and telling how.

Through the co-operation of the secretary of the Textile Bag Manufacturers Association with Army, Navy or other government procurement agencies, problems involving need for indicated quantities of particular types of textile bags for specific government purchase programs of such agricultural products as beans and potatoes or such secondary agricultural products as flour or sugar have been effectively solved. In such cases it was necessary to bring the procurement agency, producers of the product to be packed and the manufacturers of the bags together in a three-cornered mutual understanding of the needs of the particular situation and the manner in which it could be met.

Serious situations have developed from time to time, such as shortage of grain bags on the Pacific Coast and of potato bags in the State of Maine. The industry, however, with the wholehearted co-operation of government, has met each situation in such a way as to avoid serious loss or damage. Textile potato bags, for example, were at one time hurriedly produced by eastern manufacturers and shipped to Maine in Army bombers.

In spite of shortages of burlap, of which very small quantities were imported for a long period, extreme shortages of cotton cloth, tremendously increased normal demand for textile bags, and extraordinary government demands for substantially more than a half billion mildewproofed sand bags of extremely complicated and difficult construction, and large quantities of barrack bags, and many other wartime necessities, the textile bag industry has continued to perform its recognized function of keeping users of bags supplied with all their necessary requirements when and in the quantities actually needed.

The multiwall paper bag is playing an important part in the war program as a container for industrial shipments of food products, chemicals, fertilizers and construction materials for domestic use and overseas to our armed forces and civilian populations of allied nations and occupied countries.

Multiwall paper bags are being used extensively by the Army, Navy, Marine Corps, the Procurement Division of the Treasury Department, the War Food Administration and the Chemicals Bureau of the War Production Board, due to their strength and durability and the protection afforded against moisture penetration, contamination, infestation and spoilage. Because the multiwall paper bag is constructed of multiple walls of specification paper, and is tailor-made to fit shipping conditions and product packed, additional plies of special papers may be incorporated in the bag in order to meet specific shipping hazards.

At the beginning of the war, the multiwall paper bag industry was called upon to study the overseas shipping problems and develop multiwall paper bags which would protect products being shipped against the numerous and unusual hazards encountered, such as tropical heat, sub-arctic cold, submersion and exposure to the elements. After tests were made, multiwall paper bag specifications were written and include such special construction features as the use of:

1.—Multiwall specification kraft paper, insuring strength and preventing contamination or infestation of the product from outside sources.

2.—High wet strength papers which will not disintegrate when subjected to submersion in water for a period of 24 hours.

3.—Moisture-resistant papers to prevent the penetration of moisture vapor.

4.—Grease-proof papers to prevent the penetration of grease through the plies of the paper bag.

5.—Special sheets designed to resist chemical actions, offering protection against disintegration of the paper by chemical action of the product packed, or protecting the chemical content of bag from destructive action from outside elements.

6.—Waxdipped ends to prevent the penetration of water or moisture vapor through the sewn ends of the bag.

Quite understandably the multiwall paper

(Continued on page 25a.)

Enriched Flour Equals Whole Wheat in Supplying B-Complex Vitamins

ENRICHED flour was found to "promote the same amount of growth" (in white rats) as that obtained when the rats were fed whole wheat, in a biological assay conducted at the Kansas Agricultural Experiment Station. The research, comparing nutritive qualities of different types of flours, was conducted by Dr. Beulah D. Westerman of the department of home economics and Dr. E. G. Bayfield of the department of milling industry. The report on the results of their research is contained in the January issue of The Journal of Nutrition. A portion of the report follows:

"About one third of the total calories of American and British diets is obtained from bread and cereals. For European countries other than Great Britain, this figure is increased to 50% or more. As flour occupies such an important place in the diet, it is desirable that it be of high nutritive value.

"It is well-known that whole wheat grain contains more nutrients than patent flour. Several methods have been used to improve the nutritive value of patent flour. Addition of minerals and synthetic vitamins to patent flour, or modifying the milling process so as to retain more of the nutrients of the whole grain, are two means of increasing the mineral and vitamin content of the flour. In addition bread may also be improved nutritionally by the use of high vitamin yeast and other supplements. Enrichment of flour is doubly important since it is used in many forms besides in bread."

The authors, in a review of research that has been published, point out that it has been shown that the addition of milk solids to bread increased the nutritive value. Other scientists had determined that white bread enriched with thiamine, niacin, iron and riboflavin did not promote as good growth in rats as when nonfat milk solids were added.

Reports of other research upon the nutritive quality of bread that was mentioned in the article included: Consumption of extra B complex vitamins improves the biological value of proteins; better weight gains in rats were obtained when white bread was supplemented with lysine, valine, salt mixture, vitamins A, D, E and riboflavin, and the supplements of enriched flour plus 6% dry milk solids gave the same results as whole grain flour.

Drs. Westerman and Bayfield, in their report, state that "growth studies on albino rats were conducted in order to compare the relative values of whole wheat, with a Morris type flour and enriched flour, as sources of the B complex vitamins, when these flours are included as 30, 40 and 50% of the diet."

In their feeding tests, young albino rats weighing between 40 and 50 grams were used. Each animal was placed in an individual cage. They were allowed to eat and drink all they wanted. All rats were fed a diet free of the B complex vitamins for 12 days before the beginning of the test in order partially to deplete their body stores of these vitamins.

At the end of the depletion period they were divided into groups of five or eight animals and placed on the test diets. The supplementing materials were whole wheat, Morris type of flour, patent flour enriched at the old levels with thiamine, niacin and iron and patent flour enriched at the present levels with thiamine, niacin, riboflavin and iron.

The average American diet contains approximately 30% cereals. In some cases this may be increased to 40 or 50%; therefore the supplements were incorporated into the diets at 30, 40 and 50% levels, the authors state. Commenting on the test, they state:

"The animals on the Morris type flour and the old level enriched flour showed parallel weight changes and lost an average of 5 grams during the 48-day test. Those receiving whole wheat gained an average of 11 grams showing that when fed at a level of 30% of the diet, whole wheat used as a source of the B complex vitamins promoted better growth than either the Morris type of flour or the old-level enriched flour. The animals were also more alert and their fur had a better texture."

"The animals on whole wheat at the 50% level gained an average of 41 grams during the 48-day test period. They had the appearance of healthy rats. When ordinary patent flour was included at this level, the animals lost weight slowly and died by the 36th day. Those on the old-level enriched flour weighed, on the

(Continued on page 24a.)

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CHICAGO, ILLINOIS

Insect-Free Flour

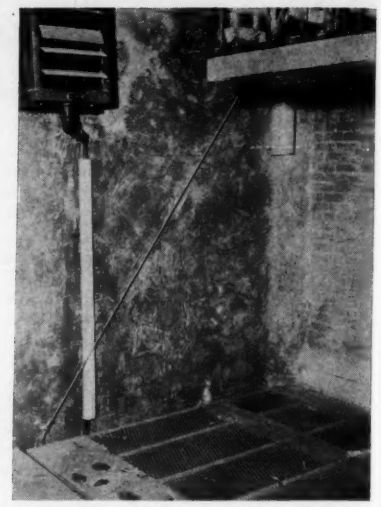
(Continued from page 4a.)

flour on the small area of the bolting surfaces. This cloth will remove the foreign matter and the larger forms of insects, but the eggs and small larval forms often pass through with the flour.

The ability of silk bolting cloth of proper fineness to remove all stages of insect life has been definitely established. High-speed sifters equipped with sieves of 10XX bolting cloth are in common use for this purpose and are efficient as long as there are no breaks in the cloth, or infested flour does not drop into the conveyor below as a result of carelessness during inspection or repair of the sifters.

If sifters are used for redressing, flour conveyors between them and the packer bin should be frequently inspected, and any infestations that become established in them promptly eliminated.

Reels, when used alone, are inadequate for redressing, since they are so constructed that insects removed from the flour can crawl into the conveyor carrying the redressed flour. Reels can be used successfully, however, in conjunction with a centrifugal machine. These machines can be installed directly in the top of packer bins, or outlet spouts from them can be directed to one or more bins as desired. Flour spouted to such a machine is hurled by centrifugal force between two flat horizontal steel disks 1 5/16 inches apart, which revolve on a central shaft at 3,500 rpm inside of a housing. Small, round, hardened-steel posts are closely spaced in two concentric rings between the two plates. The impact of the flour against the revolving plates, posts, and housing is so great that insects of all stages, including the egg, are killed. Units vary in capacity from 20 to 150 sacks of flour per hour. They may be used separately or in conjunction with either reels or sifters.



Shown above is a detail view of a bag fumigation vault. The fumigant is placed in the overhead pan in the upper right corner of the picture. The steam heating unit in the upper left is equipped with a circulating fan. The floor of the vault is made of metal lath over 2x4 inch sleepers, which allows for circulation of the fumigant.

PROTECTING THE FLOUR AFTER MANUFACTURE

The responsibilities of the miller do not cease with the production of an insect-free product. Unless the flour reaches the consumer in perfect condition, the reputation of the miller is at stake. If the product is not properly packaged and protected from insect attack in storage and transit, much of the effort expended in the manufacture of a clean product may be wasted.

Infestation in Mill Warehouses

It is necessary for the flour miller to keep adequate stocks of the different grades of flour in order to meet the demands of the trade. Warehouse space must be provided and proper precautions taken to prevent insect infestation of flour stocks during the periods of storage.

Infestations of flour stocks in mill warehouses occur all too frequently and may originate from a number of sources. Eggs or small larvae of flour beetles (fig. 3) may be packed with the flour if it is not properly redressed, or if it becomes contaminated between the redressing machinery and the packer. Temporary storage near bran, shorts, screenings, or overs from redressing machinery may permit insects to crawl from these products to the freshly milled flour. Temporary storage in the warehouse of returned infested flour, or of flour purchased for blending purposes, may account for the spread of infestation

As an added precautionary measure, the bags may be sprayed with a contact spray after they are piled in the bag room.

"ENTOLETER" SAFEGUARDS REPUTATIONS

PROTECT
YOUR PRODUCTS
WITH
THIS MODERN
INSECT
CONTROL

While all good housekeeping practices are important, the final *essential* safeguard is to make certain that no insect life is present in raw materials, in blending stocks and in the finished product before packaging. This calls for *continuous* control, applied as part of the processing operation.

That is why more and more millers are extending "ENTOLETER" Continuous Insect Control throughout their plants. The remarkable benefits obtained through the operation of one or two "ENTOLETERS" in a mill are the most compelling reason for extending this protection to all key streams. Write today for bulletin, describing "ENTOLETER" applications. Entoleter Division, The Safety Car Heating and Lighting Company, Inc., 1189 Dixwell Avenue, New Haven 4, Connecticut.

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INFESTATION DESTROYER
REG. U. S. PAT. OFF.
CONTINUOUS DESTRUCTION OF ALL INSECT LIFE

"BUGS" BEETLE SAYS . . .

Valier's Guarantee
"No More Bugs"
Many attempts have been made through the years by those interested in packaging Cake Flours and Pancake Flours to sterilize their products so that they could be safely carried through the summer months.
These attempts all failed until the perfecting of a simple mechanical device (the entholeter) which destroys eggs, larvae and all living insects.
Installations of this machine have been made on our Cake Flour, Pancake Flour, Buckwheat Pancake Flour and Delseal Family Flour packaging lines.

Uncrating new "ENTOLETER" at mill.

Bad News For Bugs!

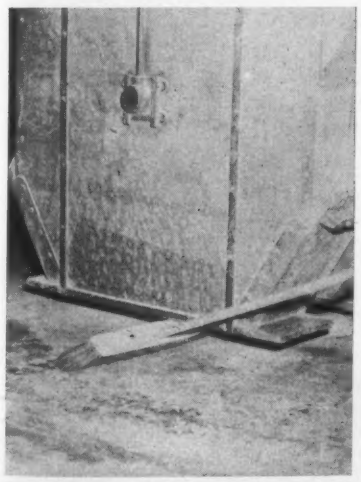
Bulletin prepared by Valier & Spies Milling Company to inform their salesmen about the "ENTOLETER" Insect Control in these mills. Steadily extending their modern infestation control, Valier & Spies have just installed six new "ENTOLETERS." They bought their first 25 bbl. "ENTOLETER" in 1941 and in the following year added a 50 bbl. machine. Additional "ENTOLETERS" purchased were one 75 bbl. unit in 1943 and two of the same capacity in 1944.

to clean stock. Insects find hiding places in the woodwork of floors, walls, and dunnage and fresh flour is often invaded by large numbers of insects from such sources. They may also fly in from elevators or other grain-storage structures nearby.

The ideal flour warehouse should be of concrete, stone, or brick, with concrete floors that can be readily cleaned and do not provide any place in which insects can hide and breed. Care should be taken to see that only properly redressed flour, free from insect infestation, is placed in storage. No feed, screenings, returned flour stocks, or second-hand flour bags should be stored in flour warehouses, even temporarily. Broken or damaged bags of flour should be stored separately and disposed of quickly. The storage of bagged flour on lift platforms is desirable when such equipment is available since it will keep it off the floor and facilitate the removal of accumulations

All used bags should be thoroughly cleaned. Fumigation of used bags, before bringing them into the mill proper, is recommended.

therefrom. Strict sanitary measures should be practiced, no dust or accumulations of flour being allowed to remain. Flour stocks should be kept as low as possible, and all old stocks disposed of before new lots are touched. After a stack of bagged flour is disposed of, the section of the floor from which it was removed should be thoroughly swept and, if necessary, sprayed. An occasional fumigation with methyl bromide will



Clearance between the floor and elevator boots should be sufficient to permit easy and frequent sweeping under the boots.

destroy all insect life if the warehouse is of tight brick, stone, or concrete construction. If the construction is not of this type but can be made reasonably tight, a general fumigation with hydrocyanic acid gas or chloropicrin will clean up infestations in the open spaces around the stocks of flour.

Infestation in Transit

Flour products leaving the mill or warehouse do not usually go directly to the consumer, but must be transported by truck or railway car to other warehouses, bakeries, or grocery stores for distribution. During this transit it is subject to invasion by insects. Railway cars used to transport flour have, in many cases, also been used to carry grain during the rush of the harvesting season. The ordinary car is so constructed that waste grain, grain dust, or milled cereal products become lodged in cracks and crevices in the woodwork and behind linings. Consequently, infestations that are difficult to eradicate by the ordinary clean-up methods become established in cars used for carrying grain. As soon as fresh flour is placed in infested cars, the insects are attracted to it. They crawl over the bags, thrust eggs through the mesh of fabric, and enter them wherever possible.

The time of greatest danger from infestation in transit is in the summer after the cars have been used for carrying grain or feed. At this time also, insects of many kinds, including species that infest grain and flour, are in flight in large numbers and enter the cars before or during loading operations. Lights used in loading cars may also attract large

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See how light they always are! And wait till you taste 'em! Yum-me-e!!! There is the test . . . there is the reason why Mrs. Housewife favors self-rising flours leavened with LUCKY LEAVEN. So put your trust in LUCKY LEAVEN — the phosphate that consistently bakes better biscuits!

The unsurpassed stability of "Lucky Leaven" safeguards the stability of your self-rising flour after it leaves the mill.

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Richmond, Va.

numbers of insects, and although they may not all be pests of stored flour their presence is annoying and often causes cars to be rejected on arrival at destination.

Steel cars can be effectively fumigated, but wooden cars are not well adapted for this type of treatment. As a routine precedure it is probably too expensive to be practical. Blowing them out with a jet of compressed air is probably the most effective and economical method of cleaning cars before loading, although the present construction of railway cars makes it difficult to reach all accumulations of grain and milled cereals. Spraying with contact insecticides is probably of some value, but cannot be relied upon to eliminate all insects. Lining the cars with heavy kraft paper will aid materially in protecting the flour during short hauls. The paper acts as a temporary barrier which is effective for short periods even in heavily infested cars.

Mills experiencing difficulty with insects in flour shipments during July and August may find it advantageous to fumigate the cars, after loading, with methyl bromide at the rate of 6 lbs per car. This will take care of any insects crawling around the cars or that may have flown in during loading operations. Loaded cars arriving at their destination in an infested condition can be fumigated successfully with methyl bromide, at a dosage of from 10 to 12 lbs per car. Before using methyl bromide, however, the poisoning hazards attending its use should be understood, and in applying it the methods of handling it so as to avoid these hazards should be carefully observed. These are given in the publication cited earlier in this article. Cars fumigated immediately before they leave the mill should be properly marked with warning placards and opened for aeration for several hours before they are unloaded, unless they have been enroute for several days.

Railway companies make strenuous efforts to provide cars free from infestation, and most of the cars supplied by them for flour shipments are in excellent condition. The shipper, however, should examine all cars before loading as a matter of principle, and if a car is found to be in poor condition it should be rejected or put in proper condition for use by the employment of appropriate cleaning methods.

——BREAD IS THE STAFF OF LIFE——

Plant Safety

THE most serious drawback to the safety movement is the way it has been approached. It is like the man who did not know what to buy his wife for Christmas, so he gave her a card with a check and considered the obligation satisfied. That will not do in safety practice. When top management designates the right man as safety director with funds and authority, he expects reports of work done and results accomplished.

It has been argued that authority to the safety director would clash with production authority and so impede production. This is a decided misconception. The safety director would not exercise production authority further than to exact safety procedure, through proper channels, which has been proven to accelerate production.

The man as safety director should be one who knows how to use authority.

Herein is the top management's active part.—H. J. Aldrich, Spencer Kellogg & Sons.

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Larvacide offers you a thorough control program for long range planning. This program includes Spot Treatments —General Fumigations—Grain Fumigation — Machinery Treatment—Rodent Control (without carcass nuisance)— Vault Treatment of Small Lots, Returned Sacks, etc.— Box Car Treatment (to protect your flour en route).

SHARE THE EXPERIENCE of Millers, Elevator Men, Feed, Seed and Food Storage Men operating plants of every size and capacity. These men have found in Larvacide the sound, always dependable means to GOOD Pest Control.

Protein Production by Plants

(Continued from page 5a.)

Rainfall as a force either in developing a soil or in depleting it cannot be measured directly by considering the annual precipitation. Rather it must be considered in terms of its effectiveness in rock breakdown and the removal by leaching of the resulting products. Evaporation, favored by wind and higher temperatures, reduces the effectiveness of the rainfall in this latter respect. Higher soil temperatures increase it. When rainfall is put as its percentage of evaporation from a free-water surface, as Professor Transeau of Ohio has interpreted and delineated the records of the United States Weather Bureau, we can see that the summer precipitation under more wind and evaporation of the central United States has not leached these soils so highly. Consequently, we can understand why, in spite of annual rainfalls much greater than Kansas, the central states still had tall, virgin prairie grass but have lately been productive of carbohydrates (rather than protein) to give the corn belt its business in fattening western grown animals or growing fat ones as illustrated by pork production.

Increase in weathering forces may be first constructive and then destructive in terms of the soil's reserve minerals and the nature of its clay. Should we lay the pattern of rainfall over that of the ratio of rainfall to evaporation, we shall have help in understanding Dr. Marbut's soil map of the United States. Then, when we view these climatic forces of rainfall, wind, evaporation, and temperatures as factors, it is not so difficult to see our western area as it represents increasing forces in soil construction and the eastern area as increasing forces in soil destruction.

The soil pattern is the result of these climatic forces. Is it possible, then, to see the belt of soil running north and south through the central United States as the balance between the forces, or with the maximum of soil construction and the minimum of destruction as the acme of good soil formation? Is it not possible to see there the production of a significant amount of clay in the soil, but not such a complete breakdown of the original rocks as to leave only clay in the surface soil, as is true in the humid tropics, for example. In these favored central and midwestern areas, that we may call the midlands, the soil contains reserve minerals of other than quartz in its silt ready to weather out now and pass on their nutrients for crop production. Soil construction has gone far enough to have removed the injurious alkaline elements, but not far enough to have taken away the alkaline earths, namely, calcium and magnesium, and other elements following in a chemical property series. It has, however, broken these essential nutrients for plant and man out of their rock forms in sufficient amounts to load liberally the clay complex with them, and in forms readily exchangeable to the plant roots.

The generous presence of calcium and other similar mineral elements in the soils of the midlands has encouraged natural legume growths to fix nitrogen and to build up in the soil the generous stock of black nitrogenous humus so characteristic of the chernozem soils of the northern extremity of this belt. It is this particular fertility situation that gives these soils their great depth and uniformity. They are characterized not only by excellent granular structure but also by liberal stores of nitrogen and other elements to invite root growth far down into well aerated soil by which these plant parts get significant amounts of effective water even if it is present only at low concentrations. This fertility aspect cannot be so nonchalantly divorced from the chemical composition of the plants produced thereby, whether we consider their forages for animal feed or their

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The HAAKY PRESSURE Method is a grain-against-grain RUBBING action—under *positive control*—instead of the old violent impact method. In mills throughout the U. S. and Canada, it is daily demonstrating these advantages:

Cleaner scouring—no grain breakage—immediate adjustment of scouring while machine is in operation—more efficient aspiration—lower cost low-speed operation—(compact space-saving design)—and the reduced fire hazard of all metal construction. Write for details.

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grains as human food, more especially in terms of concentration of protein and other aids to growth as contrasted to that of carbohydrates of fattening value mainly.

In the eastern states with their higher rainfalls and particularly with their higher temperatures as one goes south and southeastward, these climatic forces are severe enough to represent soil destruction. Calcium is readily taken off the clay by the leaching waters saturated with carbonic acid coming from decaying woody vegetation both within the surface soil and as deposits above it. In place of having calcium left on the clay, there is the hydrogen or acid. We speak of these soils that are deficient in nutrients by labeling them as "acid soils." We classify them as producers of "soft" wheats. They give us this crop high in carbohydrates mainly rather than in proteins and all else that is associated with protein production.

In the much warmer South, the more reddish clay is chemically and mineralogically different. It does not have the capacity to hold even hydrogen or acid so generously. Nor does it hold the many other positively charged chemical elements of nutritive value. Wheat grown on such soils is readily classified as soft wheat. Rainfall is erroneously considered to be directly responsible for this pronounced inclination toward production of carbohydrates, while we are oblivious to the wide differences in the fertility conditions of the soils. These, as the second factor in plant production, join with the weather to give us all the different kinds of vegetation that serve to embellish the entire land surface of the earth.

Surely the soil, as it is developed by the climatic forces to deliver fertility generously or as it is leached to where it does little more than hold water, cannot be disregarded so completely when the vegetation changes from legumes to nonlegumes or even to woody forests in going across the United States. Nor can we forget the soil fertility when the West once supported buffaloes feeding on short grass and today is growing beef cattle naturally, while, in contrast, the East and Southeast can maintain cattle only by help of the utmost in veterinary and nutritional sciences. As one goes from natural legumes to pine trees in the ecological array and through all the variations in socio-economic pattern as well, can rainfall or "environment" as an all-inclusive term be taken as the great causes underlying it, all with no further thought for the soils that in joint service with rainfall make the growths of plants possible?

Lowered soil fertility in highly developed soils brings the photosynthesis by plants into prominence.

Plants have long been distinguished for their photosynthesis. This is the activity by which they use the energy of the sunshine to combine water with carbon dioxide of the air and form carbohydrates like starch, cellulose, lignin and others. Oxygen is set free as a by-product. It is photosynthesis that uses the weather as parts and power to build plant bulk, so readily recognized. It is this that constructs the plant's skeleton whereby the roots go down to get water and the tops go up to get air and sunshine.

Even the woody skeleton of any plant cannot be made without drawing on the soil for some help, particularly potassium that serves in the fabrication of carbohydrates though it need not occur in the finished product. Soil producing any vegetation must provide this element. Even those of low fertility, in general, can still use weather to carry on photosynthesis. Most any soil is then not commonly prohibited from making carbohydrates such as starch, cellulose or wood to help us understand why among the wheats "heavy yielding varieties are likely to produce grain of lower protein content."*

Well developed soils then can still produce starchy grains. These are the prominent crop products in the corn belt or the eastern limits of the prairies and the areas cleared of hardwood forests. Sugars and cotton fibers, emphasizing their decidedly photosynthetic origin, are products of southern agriculture. They are now coming from areas originally given over by nature to wood production by pine trees.

Higher fertility in less developed soils brings the biosynthesis by plants into prominence.

Parallel with the increasing protein in the wheat grain as one goes westward from the central states, we can recognize the increasing prevalence of legume crops and natural legume plants. Legumes draw thus heavily on the mineral fertility of the soil, and as a very common thing their success as crops in the eastern states demands applications of calcium in limestone and of fertilizers. Is it, then, beyond reason to see in a varying soil fertility the underlying cause of the increasing proteinaceousness in a single cultivated crop and the increasing mineral contents in all the different crops arranged in order from east to west?

Protein production by the plant cannot be divorced very readily from

*Dr. M. A. McCall. What determines protein? Temperature? Soil type? Rainfall? The Northwestern Miller, Sept. 13, 1944.

Sure we're proud . . . who wouldn't be with a production record like that.

According to our calculations, it happened during the past month or so. In some kitchen, somewhere in America, the 200 billionth V-90 biscuit came out of the oven . . . like each of its predecessors an appetite tempting delicacy that's becoming a daily favorite among folks who enjoy good eating.

Yes, in the six years that V-90 has been on the market, this remarkable, slow-acting leavening has had plenty of opportunity to prove itself under widely varying baking conditions. Winter or summer, time and again V-90 has demonstrated its superior baking action . . . in biscuit volume, color, texture . . . in just plain good eating quality.

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its demand for a higher level of fertility that naturally will have calcium at the head of the list of its available elements. Protein production is not so simple as a matter of only photosynthesis. It is a matter of what may be called biosynthesis, or the expenditure by the plant of some of its energy compounds, like sugars and starches, for the synthesis of many complex compounds of which proteins, their amino acids and other similar essential compounds are examples. Photosynthesis can take place only in the presence of light. Biosynthesis occurs in the absence of light. Protein is a product of the plant's own life processes not wholly dependent on sunshine. It registers most commonly as output in the form of seed. Photosynthesis, so largely dependent on weather, is readily appreciated in terms of the bulk produced. Biosynthesis is not so readily recognized when its products as "quality" in the grain or forage consist of proteins, probably vitamins, organo-mineral combinations, and many other essential complexes not yet appreciated as plant elaborations dependent on soil fertility rather than on weather.

Experiments demonstrate protein production associated with a wide calcium-potassium ratio.

Experimental work using plant nourishment controlled by colloidal clay soil has pointed out clearly that soils similar to those highly developed under stronger climatic forces will make even our legume crops function mainly as producers of carbohydrates. On soils made similar to those less developed, the legumes are producers, pronouncedly, of protein. By control mainly of the calcium in higher ratio to the potassium we can put the emphasis on biosynthesis in the plant's activities in contrast to photosynthesis. There is more nitrogen used by the plant both from the air and the soil. Young plants given opportunity to get calcium in the first 10 days of their life are much more efficient in taking nitrogen from the soil when transplanted than are those denied this extra calcium. Legume plants grown where the calcium supply is relatively low in contrast to that of potassium are rich in carbohydrates and low in protein. When the situation is reversed to make calcium relatively high in this contrast, then the proteins are relatively high and the carbohydrates relatively low in concentration.

Here is a basic principle of plant composition in relation to soil fertility, or of protein prominence in contrast to mainly carbohydrate prominence in the plant's activities according to the soil's provision of nutrients. This principle can scarcely in these times be cast nonchalantly aside for adherence to traditional beliefs that the protein concentration of the wheat grain is a matter only of plant pedigree, lowered annual or seasonal rainfall and other factors so easily thrown together under an all-inclusive term like "environment." In this principle is a partial understanding of the general belief "that heavy yielding varieties are likely to produce grain of lower protein content."* Protein is a biosynthetic product. To disregard a soil fertility element like calcium, that is at the head of the list of elements in terms of amounts needed by animals and man, and that has "synergistic" effects in mobilizing the other necessary elements into the plant roots, is merely a refusal to search out the physiology involved and a contentment in the one well-known fact that high protein concentration in wheat grain requires at least a liberal mobilization of soil nitrogen at the time near seed formation.

Plant formation is more than merely collecting some ten or a dozen elements from the soil and four from air and water. It is a biosynthesis of high complexity in which shortages in supplies of the necessary elements, improper balances in their relative amounts, and poorly timed delivery of them can control a matter like the amount of protein in contrast to the amount of carbohydrate in the grain of wheat.

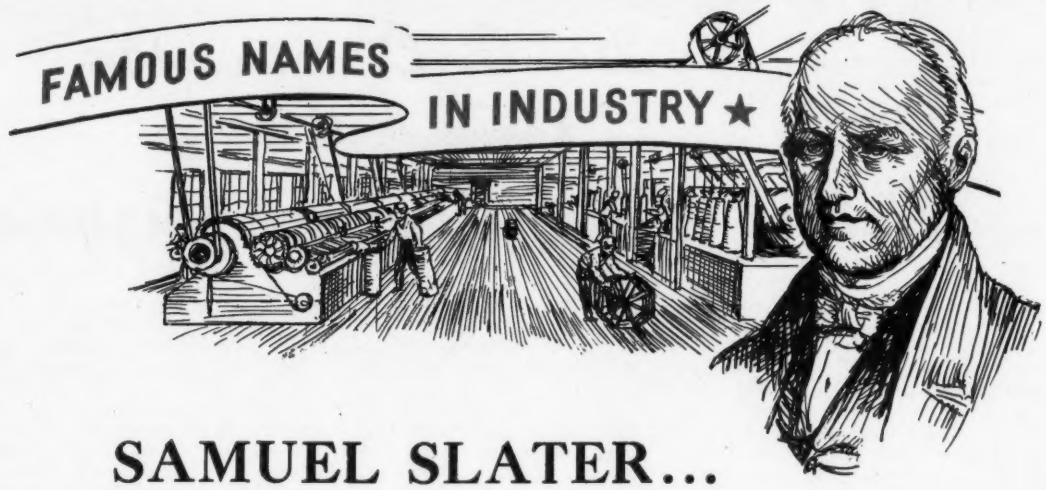
Experiments show importance of timely delivery of nitrogen connected with carbon-nitrogen ratio regardless of climate.

That the matter of nitrogen delivery in liberal amounts at particular times by the soil plays a prominent role in controlling the concentration of the protein in the wheat grain was demonstrated by Dr. R. L. Lovvorn in his studies at the University of Missouri. He produced variations in protein concentrations from 8.69 to 17% by varying the time and amount of nitrogen application on the same field growing the same wheat variety. This says nothing for the variations in yields as bushels per acre also induced thereby to range from 11.5 to 24.2. Nitrogen delivery to the plant is not only a matter of soils with a high content of nitrogen by chemical analysis. If such were true, our peat soils would be excellent wheat soils instead of poor ones. Nitrogen delivery is the result of microbial activities, but only when these microscopic life forms are fed a ration of soil fertility that will let them discard soluble nitrogen because they are struggling against a shortage of carbon or energy materials. Microbes, too, as a crop within the soil consume soil fertility.

In this principle of the balance of

(Continued on page 16a.)

*M. A. McCall. What determines protein? Temperature? Soil type? Rainfall? The Northwestern Miller, Sept. 13, 1944.



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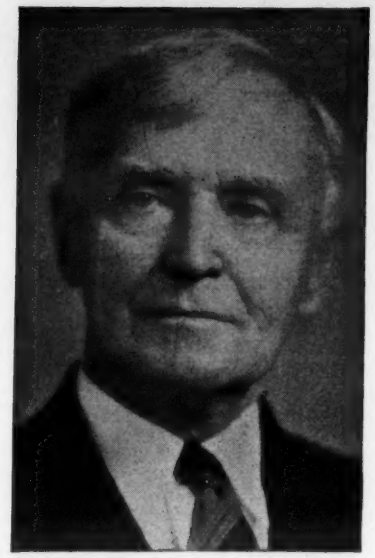

Dr. C. O. Swanson
Kansas State College

Nature of Enzymes and Enzyme Activity

LIVING matter presents two aspects. There must first be a place for the residence of life. These are the living cells. The life principle furnishes the directing force for the various activities. In the functioning of life, there must also be tools to do the work or give expression to life's activities. The principle or impulse of life exists in the living organism and uses the enzymes as its tools for the various activities. Life functions could not go on without enzymes. If enzymes are destroyed life ceases to function. But while enzymes serve as tools, they are more than this since they can act apart from the living cells and they persist for some time after the life principle has departed.

Enzymes as Proteins and Colloids

Enzymes are classed as proteins from the standpoint of chemical composition. Several writers state that they are proteins. They have large molecular weights, in the range of 36,000 which is generally accepted for many proteins. Some enzymes have an even larger molecular weight which is also true of certain proteins. Many enzymes are inactivated and even decomposed by the same proteases which act on proteins. Some metallic ions which denature the proteins are also harmful to enzymes. Temperatures which coagulate some proteins like albumins, also inactivate certain enzymes and all are so affected by high temperatures.

Enzymes are also classed as colloids, based in part on particle sizes which are much larger than those which form homogeneous solutions. The colloidal size is known from the fact that, as a rule, enzymes do not pass through parchment membranes, but most enzymes will pass through porcelain filters. This feature furnishes a means for separating enzymes from much organic material with which they are associated. In respect to size enzymes resemble contact catalysts which have distinct surfaces on which molecules may be adsorbed. This has a bearing on the manner of enzyme action.

Enzymes are made in an environment of a number of substances and some of these are adsorbed on the enzymes or are closely associated with them, making it difficult to obtain enzymes in the pure condition desired for the determination of molecular weights as well as for the study of the properties of pure enzymes. Methods of purification tend to reduce the activities of the enzymes. Enzymes are associated in mixtures not only with other material, but several enzymes occur together. In fact many preparations like zymase and some proteases consist of several enzymes. A number of enzymes have been crystallized and these are shown to be proteins. The true nature of most enzymes may be said to be unsettled.

Specific Action of Enzymes

Enzymes differ from inorganic catalysts in that they are more specific in their action; an enyzme will act on a particular substrate and on no others. As a catalyzer, the hydrogen ion of mineral acids will hydrolyze proteins, carbohydrates and fats but each of these groups of compounds must have its own class of enzymes, and not only that but there are several enzymes for each group. While a mineral acid hydrolyzes starch to glucose, one enzyme, diastase, hydrolyzes starch to maltose, and another enzyme, maltase, hydrolyzes maltose to glucose. A mineral acid hydrolyzes a protein to amino acids, while one protease like pepsin produces proteases and peptides, then peptases change these to amino acids.

Enzyme Structure

According to one theory (Waldschmidt-Leitz, 1933), enzymes consist of two parts: (1) a carrier which is colloidal in nature and (2) one or more chemically active groups of atoms. The colloidal carrier gives stability to the enzyme structure, and determines the magnitude of the catalytic activity possible through the active group. The nature of the active group is different in each enzyme and is responsible for the specificity of the enzymes. These active groups thus accomplish the particular chemical change influenced by an enzyme. The active substance of an enzyme cannot exist alone in solution but must always be accompanied by the colloidal carrier.

The colloidal structure appears to be one reason for the sensitivity of enzymes to the presence of certain substances. Adsorption is afforded opportunity on the surface of the colloidal particle. Contact catalysts are easily poisoned by substances which are allowed to be adsorbed on their surfaces. Many enzymes likewise are inactivated by the ions of heavy metals such as silver, mercury and copper. Some heavy metals have a coagulating action on proteins and injury may be due to the effects on the colloidal protein carrier. Substances which inactivate or destroy enzymes are known as paralyzers or inhibitors. Salts of heavy metals are notable paralyzers. Hydrocyanic acid (HCN), hydrogen sulfide (H_2S), formaldehyde and chloroform almost always have an inhibitory or toxic action on enzymes. Paralyzers may act either on the enzyme itself or on the substrate by making it less available.

Effect of Temperature

Enzymes are sensitive to heat. The optimum temperature for many is between 37° and 55° C. Some have a higher optimum temperature. Many are injured by temperatures above 60° C. and most are destroyed at 100° C. Enzyme activity is accelerated as the temperature is increased up to the optimum. Beyond the optimum the activity decreases because the temperature becomes harmful to the enzyme structure. The destruction by heat is most probably due to the alteration in the colloidal carrier.

Activators or Accelerators of Enzyme Action

There are also substances which increase or accelerate the catalytic activities of enzymes. These are known as activators or accelerators. Some salts stimulate enzyme activity. In many instances the activation of an enzyme by an added substance may be explained by the neutralizing effect on the inhibitors or paralyzers. Papain is said to be activated by certain amounts of hydrocyanic acid, cysteine, glutathione and hydrogen sulfide. Some enzymes which have been inactivated by the ions of heavy metals may be reactivated by certain of these reagents.

Acidity or Alkalinity

Each enzyme has an optimum hydrogen ion concentration or pH for maximum activity. The activity increases towards the optimum and decreases either towards the more acid or the more alkaline reaction. Beyond definite amounts of acidity or alkalinity the enzyme becomes inactive or is destroyed. Rumsey (1922) obtained 305 milligrams maltose by digesting 10 grams flour in a water solution which has a pH of 5.2 due to the presence of HC1. At pH of 2.78 (too acid) the amount obtained was 35 milligrams and at pH 9.1 (too alkaline) the amount obtained was 10 milligrams. Outside these pH limits no maltose was produced, indicating complete paralysis of the enzyme.

Some enzymes will hydrolyze their substrates in neutral solution but the rate is slower than at the optimum pH. The optimum pH or reaction varies for different enzymes in the same class. Thus for malt amylase the optimum pH is given as 4.3 but for ptyalin (saliva) it is 6.1. The optimum for pepsin in the stomach is 1.2-1.6, while for the protease from yeast the optimum pH is 4.0-4.5. The optimum for papain is given as pH 5.7.

The pH optimum for a protease will thus vary somewhat depending on what particular protein forms the substrate. The optimum pH is also influenced by the purity of the enzyme and the length of time over which it acts. The temperature also affects the optimum pH, indicating an interrelation between temperature and optimum pH. At higher temperatures this optimum tends more towards the neutral point and at lower temperatures it may be farther away from the neutral point.

Concentration of Enzyme and Substrate

The rate of catalysis by enzymes is also influenced by the relative concentration of both substrate and enzyme. The reaction velocity is usually proportional to the enzyme concentration, provided that an optimum concentration of substrate is present. There are some exceptions to this rule. The maximum total activity can occur only when the enzyme is in excess but the maximum activity per unit of enzyme occurs when the substrate is present in excess. Each enzyme unit is then at liberty to be utilized at full capacity. If the concentration of the substrate is so small that not all the enzymes are able to react, the rate of reaction is slowed down.

Co-enzymes and Pro-enzymes

Since enzymes are produced by living cells it follows that many substances are closely associated with the enzymes. Many enzymes are inactive unless they are accompanied by some of these associated sub-

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stances which are called co-enzymes. In a certain sense co-enzymes act as activators. Co-enzymes occur in much smaller particles than the enzymes and can therefore be separated out by dialysis through parchment membranes. This separation from the co-enzymes inactivates the enzyme. The separated co-enzyme is not as sensitive to heat as the enzyme since it may be boiled in water without losing its power to restore the activity of the enzyme from which it was separated.

The production of enzymes by the protoplasm in the living cell takes place in stages. The acquisition of the catalytic powers occurs in the last stage of the development of the enzymes. Immediately before this is acquired, the other properties are, in general, like those of complete enzymes. An enzyme which has been developed just short of having catalytic powers is called a pro-enzyme, which means "before the enzyme." The term zymogen is also used. Pro-enzymes may be activated by calcium salts and dilute acids. The activator of a pro-enzyme is called a kinase.

Action of Enzymes as Catalysts

The mechanism by which the enzymes bring about the reactions which are catalyzed by them has been the subject of much study, but the exact process is not clearly known because of the many factors involved. Some of the theories advanced will be discussed briefly and a consideration of the behavior of inorganic catalysts will be helpful. These may be divided into two classes: homogeneous or those which form true solutions in water; and contact, or those which are of colloidal size. Acids are good examples of homogeneous catalysts. The most active catalyzing principle is the hydrogen ion which occurs abundantly in all acid solutions. Contact catalysts such as are used in the manufacture of sulfuric acid are oxides or compounds of certain metals. The function of the catalysts is to bring the reacting molecules together and cause them to react. This may be done in two ways. One way is the formation of an intermediate compound. The intermediate compound is of temporary nature. The catalyst combines with a portion of the substrate and forms this intermediary compound. The catalyst splits off soon after formation, leaving the newly formed compound and is thus free to repeat the action on another molecule of the substrate.

The contact catalysts may act by furnishing a surface upon which the reacting molecules or atoms may be absorbed. This brings them close together or in position to react. Close contact is a fundamental condition of chemical reactions. This explains why water may be considered a general catalyst for substances which are soluble in this medium. Water furnishes mobility so as to bring the reacting units together. As soon as a reaction has taken place between the enzyme and the adsorbed molecules of the substrate, the product is removed leaving the surface free to adsorb other molecules. The catalyst is not consumed and a small amount of a catalyst will accomplish a large amount of chemical transformation.

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Waldschmidt-Leitz, E., 1933—The chemical nature of enzymes. Science 78:189-190.

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Protein Production

(Continued from page 13a.)

the microbial diet between energy compounds and soil fertility elements there must be recognized some of the control of protein concentration in the wheat grain. The wheat crop above the soil can feed on the soil fertility, particularly nitrogen, only as the microbes are not using it. The microbes eat at the first table. The wheat crop comes in as a poor second in the race for soil fertility against these microbial life forms.

Pattern of soil fertility controls the pattern of competition by soil microbes with crop plants.

How does the pattern of soil development with its corresponding pattern of soil fertility come in to control microbial competition with the wheat crop for the nitrogen or any other nutrient of the soil? You may well ask this question. Soils in construction in the western states provide mineral fertility in dominance in the microbial diet by compounding it in a limited bulk of vegetation. But that bulk is thereby mineral-rich and proteinaceous in consequence of both biosynthesis and photosynthesis. Such soils give leguminous crops, nitrogen actively mobilized in the fertile and prominently calcareous body, and organic matter deeply and uniformly distributed in the profile as this nitrogen finds its way downward readily. All of these give the microbes an organic diet with a narrow carbon-nitrogen ratio. Such conditions bring on a microbial struggle for carbon that gives an active liberation of nitrogen as a by-product and thereby a pronounced nutritional service to wheat in making its protein.

Soils in destruction in the eastern states represent a deficiency of mineral fertility in the soil and a massive abundance of carbonaceous vegetation above the soil, with photosynthesis and not biosynthesis constituting the plant's main performance. They represent shallow surface soils with carbon in dominance in the humus which has an exceptionally wide carbon-nitrogen ratio. This makes the microbes use quickly any active nitrogen to balance it in their life struggle against the excessive carbon. Microbes in such soils compete too fiercely for the soil fertility to permit a wheat crop to do little more than content itself with photosynthesis and starch production. Its biosynthetic performances are quickly ruled out of prominence in its physiology, and "soft" wheat is the result.

The microbes of the soil take also potassium, calcium, phosphorus and other fertility elements, as well as nitrogen, away from the wheat crop when they must live on highly carbonaceous organic matter. This is what happens in wheat failure following straw of the preceding wheat crop turned under. It is this microbial competition that makes the wheat crop find the fertility elements —in a list extended much beyond nitrogen only—lowered in supply, improperly balanced, and poorly timed for maximum biosynthesis of protein. Consequently, this crop cannot convert the starch into protein and deliver with it all the other assets for making a hard whole wheat so complete a human food.

Plant fabrications depend on a plant physiology that is dependent on the fertility dynamics of the soil.

Plant fabrications, like proteins, vitamins, amino acids, organo-mineral compounds and other complexities so essential for our well being as we recognize it in good health, cannot be put under control and wiser production as long as we believe them mainly a matter of low rainfall, nitrogen mobilization, crop varieties or environment in general. Our thinking dare not exclude the degree of soil development and with it the need of fertility elements numbering a dozen or more required if wheat is to be a good human food. Though calcium is not considered a primary factor in protein concentration in wheat, it might be helpful in furthering research into the chemical composition of the wheat grain and the physiology of the wheat plant if the variable ash and calcium in the flour were recognized as something other than "dirt" or contamination.

Thus the calcium in the soil in contrast to the potassium there gives a helpful guide in our thinking about protein contents in contrast to carbohydrate contents, or about biosynthesis by plants in contrast to photosynthesis only. Moreover, these aspects of the output of plants fit into the ecological pattern of our country (if not of the world) and form a strong inducement to believe that the protein concentration in wheat is not just a matter of geography or of particular varieties. There is the suggestion that when more is finally known about wheat physiology, there will come the evidence that the soil fertility as a dynamic force more than the rainfall, the temperature, and the soil type, determines the protein concentration in our common bread grain.

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Table Showing Adequate Additions to meet U. S. Government Enriched Flour Standards

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Vitamin B_2	1.2 mg.	1.15 mg.	1.2 mg.
Niacin	16.0 mg.	13.70 mg.	15.0 mg.
Iron	13.0 mg.	12.00 mg.	12.0 mg.

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Milling 60 Years Ago

Rolls, Corrugations and Roll Speeds

By Louis H. Gibson

THE third break stock is the summit of excellency of the break stocks. The descent in quality is both ways from this break —to the first on one hand and to the sixth on the other. The use of this pyramidal form of illustration is all right as applied to the third break, but if it could be construed to mean uniformity as to the first and sixth, it would be incorrect. The first break is not so good as the sixth; the second is better than the fifth and not so good as the fourth. Thus the ascent is not uniform in both directions, either numerically or in quality.

The stock from this break is the brightest and cleanest of any, and the most should be made of it. It is fair to say that the first and second breaks are preparatory to the third and fourth; but as far as that goes, each break should be preparatory to the next, and the sixth, or last, to the feed pile. It is well to consider what follows in setting the breaks, and there is this fortunate circumstance, that when one is thus looking ahead, he is doing the best possible thing for the work immediately in hand. For example, when one is setting the second break rolls, he has in mind the quality of stock desirable for the third and subsequent breaks, and, in so doing, the product of the second break is benefited by this intelligent foresight.

Mention has been made that with soft wheat closer grinding is required on the first and second breaks than with hard wheat. This is for the purpose of getting the work of reduction sufficiently advanced so that the grinding on the third and fourth breaks may be more open. Close grinding on these middle breaks with soft wheat means soft flour and flat, soft middlings, which are difficult to purify, and, at the same time, the bran is left in such a condition that it leads to unnecessarily impure stock on the fifth and sixth breaks, and bran which it is difficult to clean.

If one were to grind as close on the first and second breaks with hard as he does with soft, the stock would be too much cut up when it reached the fourth break. Such a condition of things would suggest a more uniform grinding with this class of wheat. A good general rule in regard to the breaks would be to so grind as to keep the stock in as large pieces as possible for the next break. This idea, well followed up, would work out its own methods, and, approximately, those just enumerated.

The corrugations for the third break are usually cut 14 to the inch; sometimes 12, but not commonly so. The question of round or sharp corrugations is one which will settle itself if it is ever settled. The difference in merit as to the different corrugations is not so great but that all are being operated successfully — that is, they are making money—and every miller appears to be satisfied with the roll which he is handling. If asked squarely which form of corrugation was the best, the writer would say the one which makes the largest proportion of middlings and leaves them in a condition to be most readily purified, and at the same time yields the best quality of break flour. If asked which corrugation would meet this idea, the writer would say he did not know, as there are very many different forms made and operated under many different circumstances, and a positive opinion on such a basis would not be entitled to respect. This is a question which will settle itself when

Editor's Note.—This article is reprinted from Mr. Gibson's celebrated book, "Gradual Reduction Milling," published originally 60 years ago while roller milling was in its infancy. The observations that the author makes in the article, however, establish general principles that are as applicable today as they were at that time.

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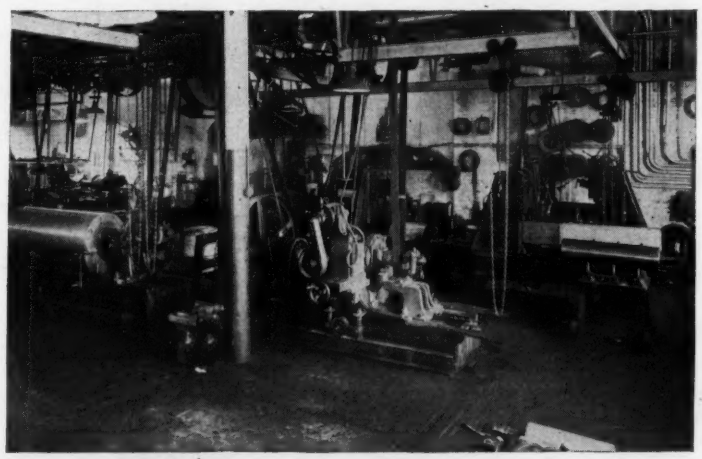

(Left) Views of our roll grinding and corrugating departments.

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there is any need for its being settled.

The speed of corrugated rolls is talked about a good deal, and might as well be mentioned in connection with the third break, as any place. It would sound very well to say that rolls should run slower operating on hard wheat than on soft wheat. At first glance this might appear to be true and to be sustained by results, but the fact is that the evils of running rolls too fast are not so apparent on soft wheat as on hard wheat. But they exist just the same, and if a high speed is wrong on hard wheat, it is wrong on soft wheat. It is supposed that we are working to get the best results; that is, to get the most money out of the wheat. Where the result of a wrong is distinctly apparent, the fact of its being less apparent under other circumstances does not imply that a wrong does not exist.

This view of the case is brought to mind by a spring wheat miller, who said, while we were looking at a set of rolls which were running very fast: "If those rolls were running on spring wheat, they would knock the wheat all to pieces, bran and all," and then as he talked about it he suggested that the evil was only one of degree when applied to soft wheat on which they were running. The general impression is that 225 to 250 revolutions per minute is about right.

The question of differential motion on breaks would be as endless as the former discussion as to the speed and dress of millstones, and will not be entered into at this time.

The scalping reel following the third break for a 400- or 500-bbl mill should be 12 feet long, and for from 100 to 200 bbls, about six feet long. A 14 corrugation on third break stock would require No. 22 wire as the proper clothing for this reel.

The fourth break stands up well with the third. It is rather specky, is softer, the granules are smaller, and the volume of stock somewhat less. More harm can be done by poor grinding on the fourth, fifth and sixth breaks than on the first, second and third. It is because the proportion of deleterious material is larger as the tail end of the breaks is reached, and then again, the bran which has been subjected to the severity of the previous reduction machinery, begins to break up and pulverize.

The legitimate end in milling is to make good flour and clean feed. These two things have to be kept in mind at every step, counting from the first break down. In order to make clean flour on the fourth and fifth breaks, one wants to touch pretty lightly on the stock, and, on the other hand, we want clean feed. Allowing that this is so, it will naturally suggest that we should grind as close as possible so as not to injure the stock as to its quality or size, on the first two breaks. This statement would bring about the old talk about different ways of grinding hard and soft wheat.

Any grinding which implies bruising or mashing is improper or wrong. It means pulverized bran, flaky middlings, and soft flour. All this is dependent upon the extent to which the evil is followed. It is a question of degree. This matter of degree is the sum and substance of milling results; it is the degree of purity or impurity in flour. There can be no absolutely pure or impure stock in the mill. The word clean, as applied to flour and feed, is in the same position. They have to be used in a licensed and unsatisfactory way.

—BREAD IS THE STAFF OF LIFE—

Room for Argument

WHEN a bin of wheat is being emptied, does the grain descend in steady levels, or does it "cone down" on top as soon as the chute opens at the bottom?

There seems to be a difference of opinion among Canadian grain men about that point. During the final session of a short course for grain elevator personnel, conducted by Dr. B. N. Smallman of the Board of Grain Commissioners and H. E. Gray of the Dominion Entomological Department, Dr. Smallman made some remarks as to the relative safety of a man "riding down" a bin of grain when it is being emptied.

Dr. Smallman stated that exhaustive tests made by commission investigators had shown that a bin empties in steady levels and it is not until about two thirds empty that the bin will "cone down" from the top.

One of the grain elevator men present at the short course challenged Dr. Smallman's assertion. He said that the bin will "cone down" as soon as the hopper chute opens. Another elevator man supported Dr. Smallman's contention.

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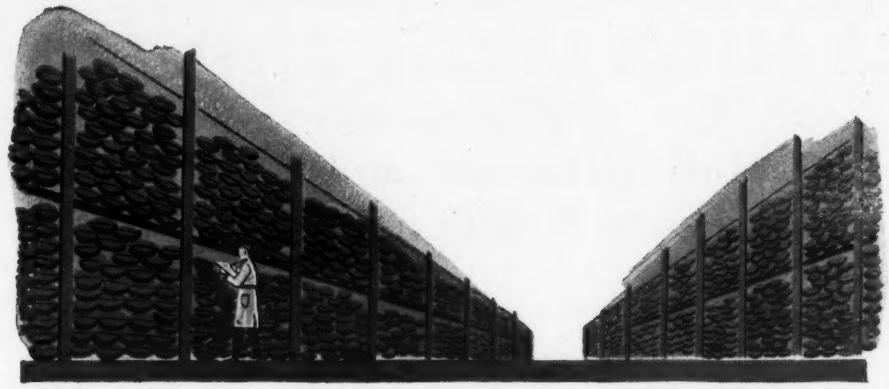

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CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

Enrichment Precautions and Control

By L. L. McAninch
Winthrop Chemical Co.

FOR the past five years millers have had a new mixture to add to flour; this mixture being a vitamin and mineral concentrate. Originally, millers made their own concentrate, but prepared standardized mixtures are available today and generally used throughout the industry. The principal problem, therefore, is one of uniform addition of the commercial vitamin-mineral mixtures.

Equipment Used in Continuous Feeding

The most common equipment used successfully today in feeding prepared enrichment concentrates are fine chemical feeders, of which two types are most commonly available; one being the grooved disc type feeder with a variable speed transmission to control the quantity fed into the flour. Another is the roll type feeder with a slide scale indicating the portion of roll being used. The latter is the type of feeder that millers have used in the past to feed powdered bleaching compounds into flour. Both of these feeders have been practical and accurate; provided, of course, that care is given to the feeders and that proper setting and checking arrangements have been established in the mill. Each type of feeder may be used for direct gravity feed into the flour stream or for measuring a uniform quantity of enrichment mixture into a current of air, which is then conducted to the flour stream.

Feeder Locations

Much care and thought should be given this subject, as many difficulties have arisen through improper location. One of the most successful locations is to place the feeder so that enrichment concentrate will enter the flour in a conveyor ahead of the bleaching agitator, the feeder being so placed that it is easily serviced.

Another location that has been considered satisfactory is to place the feeder so that the enrichment mixture is added to the flour after the bleaching agitator and in a mixing conveyor so placed that complete distribution can be achieved in the blending and rebolting system. If feeders are located on top of a flour conveyer that is close to the ceiling, there is a danger for the feeders not to be checked as often as they should be checked.

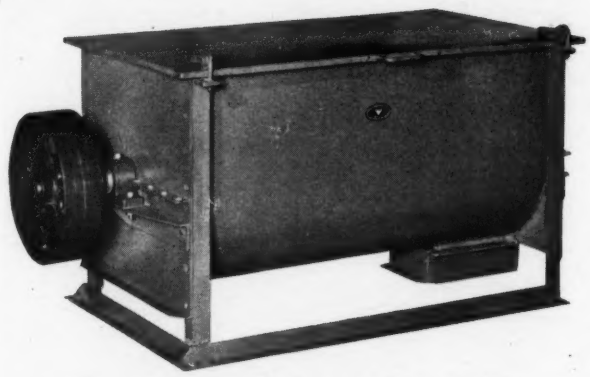
Feeding Precautions

In the two methods described above, namely, blowing the vitamin-mineral mixture into the flour stream and the direct addition of the vitamin mixture to the flour stream—there are several precautions that should be exercised.

If the enrichment is blown in, it is advisable to blow the mixture downward to a point of contact with the flour. If it is necessary to locate the feeder so that enrichment concentrate must be blown upward, then be certain that an ample quantity of air is used to prevent segregation of the mixture. All metal parts of the conduit system should be grounded to prevent the building up of static charges. It is also advisable to ground the feeder itself. When enrichment is blown into a flour conveyer, it is an excellent practice to choke the conveyer on either side of the point where enrichment is blown in. It has been found in some mills, before the choked conveyer system was arranged, that enrichment was accumulating at the end of the conveyer and in dead-end spouts. If the feeder is located on top of a flour conveyer and enrichment concentrate is being dropped onto the flour, care should be taken so that the conveyer is not breathing warm moist air up into the feeder, as this will cause both the flour and enrichment to accumulate on the working parts of the feeder, thereby eventually decreasing the accuracy of the feeding mechanism unless such equipment is cleaned very frequently. The longer "flow" the enrichment is given to disperse itself evenly within the flour, the more assurance there is of a good mixture. Having the feeder located on flour conveyers approximately 15 to 20 feet from the flour bins is a risky practice. Also, location of a feeder allowing enrichment to go into the elevator leg should be discouraged. Such practice would allow greater possibility for loss of part of the enrichment than the two methods recommended.

Since millers are required to label

"K. C. Special" *High Speed* CONCENTRATE MIXER



The "K. C. SPECIAL" Hi-Speed Mixer

APPROXIMATE OVERALL DIMENSIONS

10 Cu. Ft. (200 lbs.)	Height	—32″
	Width	—32″
	Length	—64″
20 Cu. Ft. (400 lbs.)	Height	—36″
	Width	—32″
	Length	—108″

Supporting Stand made to order.

An all-steel mixing unit for flour and feed mills.

The "K. C. Special" is designed for mixing dry and semi-solid products. It is especially recommended for mixing Minerals, Vitamin Concentrates, Buttermilk, Codliver Oil and similar ingredients with Flour, Bran, Alfalfa Meal and other ground or pulverized material.

THOROUGH

The "K. C. Special" Mixer thoroughly blends all ingredients, eliminating all lumps and balls.

FAST! CONVENIENT!

The "K. C. Special" Mixer is manufactured in two sizes — 200 - 400 lbs. with usual amount of concentrates—Will thoroughly mix in three minutes or less.

Available in belt or motor drive—with and without supporting stand.

INEXPENSIVE!

The low original cost plus the small operating expense makes the "K. C. Special" Mixer a profitable investment for all types of operation.

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their flour as enriched and guarantee a definite minimum quantity of the nutrients added, they are faced with a label claim which must be met at all times. Control records should be kept to show the care the millers are taking to assure themselves, their customers and the control officials, if necessary, of the thoroughness of their operation. It is advisable for the millers to have printed forms, to be filled in by the personnel in charge of the enrichment feeder, showing the time of checking the feeder, as well as the weight of material being fed in and the flour production at that particular time. In addition to this daily data, the enrichment disappearance should be checked, as against the total number of sacks of enriched flour produced during the 24-hour period. Some mills have their enrichment feeders installed on a scale, and this simplifies and aids the accuracy of their records. Such data will be very helpful in order to comply with the laws regulating flour enrichment.

Qualitative and Quantitative Control Tests

The importance of having enriched flour assayed periodically cannot be stressed too much as this is the only way to check the result of the carefully planned process control. As millers have been milling to rigid specifications for many years, they well know that such a check must be made, and made frequently, to insure a uniform product. This practice applies just as much to nutrients in enriched flour as to the protein or ash specifications which must be met. If a mill laboratory is not equipped for such work, there are a number of commercial laboratories available and equipped to service the industry on such determinations. It is not always necessary that all four of the nutrients in the enriched flour be assayed each time a check is made, as usually thiamine and riboflavin assays will give sufficient information. This is particularly true where a prepared enrichment concentrate is used. If the thiamine and riboflavin results are safely 10% above the minimum standards, which are:

	mg. per lb of flour
Thiamine	2.00
Riboflavin	1.20
Niacin	16.00
Iron	13.00

then the niacin and iron values most always fall in line above the minimum standards. Results of such assay tests should be attached to the process records for that day and filed for future reference.

Two Quick Tests

There are two quick and simple qualitative tests being used to advantage. They are the ultraviolet light test and chemical indicator test.

The ultraviolet light test is one whereby a sample of enriched flour is slicked alongside a sample of unenriched flour, then dipped, and the slick put under the ultraviolet light. The light wave that is allowed to pass through the filter on this lamp is 3800 Angstrom units. The enriched flour shows up a bright yellow color, due to the riboflavin photochemically changing this particular light wave to a visible light through fluorescence. The unenriched flour shows up a very deep purple, so that a great contrast is noted. This test is being used by several mills and appears to be very helpful to them. Since the intensity of the yellow color varies proportionately with the riboflavin present, it does give a miller some idea as to the amount of enrichment he has added to the flour. However, let it be stressed that this test should not be substituted for the quantitative assay determination, as the light test is by no means accurate enough to be relied upon from a quantitative standpoint.

The chemical indicator procedure is prepared the same as the light test; that is, flour samples are slicked up on a slide and dipped; then indicator solutions are dropped on the slide and the iron particles become visible as blue or red specks depending upon the indicator used. Naturally, the number of specks that become visible are in proportion to the amount of enrichment present. Here, again, this procedure is only good as a process control test to show up greater variations in case something has happened to the feeder, or some other trouble has developed.

In the two methods referred to above, samples being checked should be compared with a known standard of enriched flour.

Most millers have found that flour enrichment can be accomplished with uniform accuracy and with very little difficulty.

Words that glisten like gems

Words that tell shoppers that your flour is *enriched* gleam like gems to the eyes of the modern homemaker. They tell her that your product has extra nutritional values. Women look for these messages because a great deal of publicity has made them conscious of the need for foods rich in vitamins and minerals.

Monsanto XC Calcium Phosphate gives your plain flours enough healthful, bone-building calcium to meet government standards for calcium enrichment. Its use means better baking results. XC Calcium Phosphate keeps the flour on the acid side, thereby often saving as much as 50 per cent of the B_1 lost in baking. Better baking and better nutrition are the reasons why women make repeat purchases of flour enriched by XC Calcium Phosphate.

It is both easy and economical to apply XC Calcium Phosphate. It may be added by the use of the same batch mixers used for self-rising flours, or, it can be fed into the flour stream by most standard feeders.

The day is coming, forecasters say, when *all* flours will be enriched. That is why we suggest that you look into the possibilities of enrichment *now*. We shall be glad to send you full details on the application of XC Calcium Phosphate and a sample of our product. Mail the convenient coupon today, contact the nearest Monsanto office or write to MONSANTO CHEMICAL COMPANY, Phosphate Division, 1700 South Second Street, St. Louis 4, Missouri. District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Cincinnati, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

HT PHOSPHATE

XC PHOSPHATE

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SERVING INDUSTRY...WHICH SERVES MANKIND

MONSANTO CHEMICAL COMPANY
Dept. PH-10 Phosphate Division,
1700 South Second Street, St. Louis 4, Missouri
Please send details and sample of Monsanto XC Calcium Phosphate.

*Name*_____

*Company*_____

*Street*_____

*City*_____ *Zone*_____ *State*_____

NEW ROLLS FOR SALE

9x30s—6 prs. Allis C.O.
2 prs. N & M C.O.
1 pr. Great Western

9x36s—4 prs. Allis C.O.
2 prs. N & M C.O.
2 prs. Great Western

TWIN CITY MACHINE CO.
Minneapolis 14, Minn.

DON'T WORRY ABOUT
FLOUR ENRICHMENT

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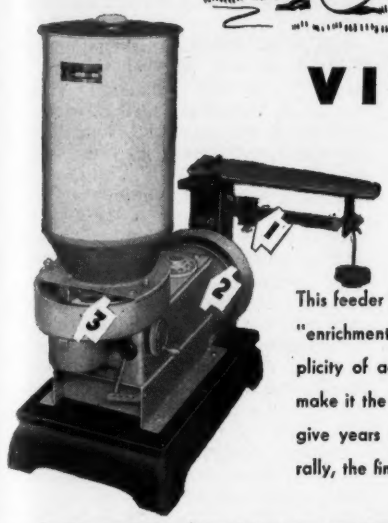
VITAMISER
INSURES
ABSOLUTE
UNIFORMITY



This feeder is a precision machine designed especially for "enrichment" requirements. Its constant accuracy and simplicity of adjustment to obtain the desired rate of feed make it the ideal feeder for vitamins. Yes, and it's built to give years of dependable, trouble-free operation. Naturally, the finer mills use OMEGA.

May we tell you all about this Vitamiser?

1. CONSTANT CHECK: weigh scale, at a glance, shows amount fed.
2. INSTANT CONTROL: hand wheel adjustment of a dial having 100 graduations.
3. SIMPLE MECHANISM: design of feeder guarantees even distribution and continuous feeding.

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(DIVISION OF BUILDERS IRON FOUNDRY)
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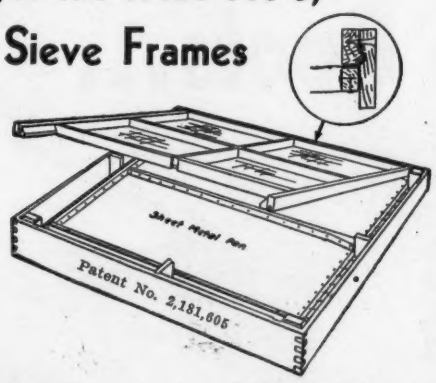

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RESEARCH, ANALYSES, and CONSULTATION for the FOOD, DRUG, and ALLIED INDUSTRIES

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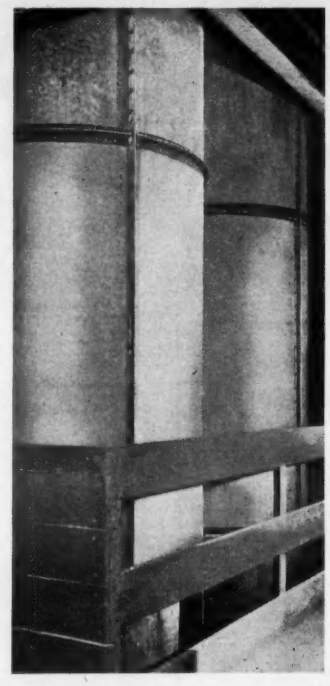
CONSTRUCTION
FLOUR STORAGE & BLENDING TANKS



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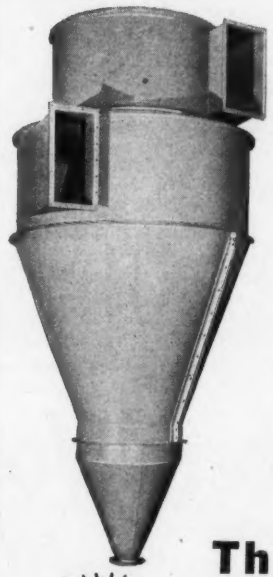

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Completely prefabricated and riveted at the factory—requiring only assembling and bolting together at the flanges. Packs compactly for shipping. Simplifies inside installations—especially of larger sizes. All the important DUAL-CLONE advantages are retained in this construction.

DAY facilities include designing, fabricating and installing all work in sheet metal of 10-gauge or lighter, including complete dust control systems, bag cleaner units, pneumatic conveyors, hoppers, spouting, etc. Write for full information.

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ARE YOU TEMPTING IT?
Do Your New Employees Know The Fundamentals of
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Write us for a supply of instruction cards to be handed to new workers. These cards list 12 brief rules of fire prevention in grain handling plants which every worker should know.

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Rubber Stoppers
Sample Cans
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Scales
Scoops
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Sprayers
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Strike-off Stick
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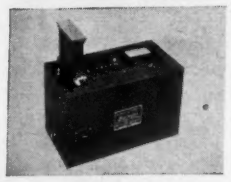

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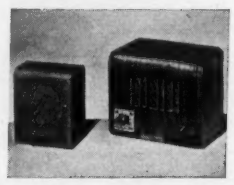

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CAR MOVER

Badger No. 221 Power King. Designed for heavy duty car spotting wherever two or more heavily loaded cars must be moved at one time. Castings are of alloy steel, handle of hardwood. Weight 20 lbs. Length 70". Price $7.43.

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SEEDBURO EQUIPMENT COMPANY

Effect of Lower Extraction Upon National Flour

THE extraction percentage of National Flour in Great Britain was reduced from 85 to 82½% Oct. 1, 1944, in order to obtain a whiter flour. The Ministry of Food, through its cereals research laboratory at St. Albans, later undertook a series of investigations to determine the effects of this reduction in extraction on the resulting flour with respect to color, content of vitamin B_1, riboflavin, niacin and iron, as well as ash and fiber. Each mill was asked to send a 6-lb sample each week to the laboratory for these studies.

The studies extended from Oct. 6 to Nov. 30, 1944, and during this period the average mill mix contained about 57% of Canadian wheat and from 5 to 12½% G.R. Canadian flour. The studies, reported in Milling, show the following comparisons:

	82½% Flour	85% Flour
Vitamin B_1 (I.u./gm)	0.88	0.97
Riboflavin (ugm/gm)	1.0	1.3
Niacin (ugm/gm)	18.04	17.0
Iron (mgm/100 gm)	1.94	2.07
Protein (%)	11.6	10.7
Fiber (%)	0.31	0.50
Ash (%)	0.88	0.98

The color of the flour was appraised on a scale of 0 to 100 where 100 represented the darker color and 0 that of white flour free from visible bran specks. The index of the 82½% flour was given as 41 while that of the 85% flour was 100.

The higher protein of the 82½% flour is thought to be due principally to the higher percentage of Canadian wheat in the mill mixes when these particular samples were collected than was present in the samples of 85% flour when the samples were collected.

The same situation is thought to account for the higher content of niacin in the 82½% flour.

During October and November, 1944, 871 loaves of bread from different parts of Great Britain were graded for quality into the following classes: good, fairly good, fair, and poor. The loaves graded as follows: good, 10.1%; fairly good, 44%; fair, 27.4%; poor, 18.5%.

In commenting on the report, the scientists at the St. Albans laboratory said that had it not been for the extremely wet harvest in England which damaged much of the English grown wheat, the percentage of good and fairly good loaves undoubtedly would have been higher.

On Jan. 1, 1945, the extraction of National Flour in England was further reduced to 80%.

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Those Winter-Worn Roofs...

HIGH winds, snow, sleet and driving rains are primary causes of worn and leaky roofs, flashings and gutters. *NOW* is the time to resurface and repair your roofs with

STONHARD PLASTIC ROOF RESURFACER

Easily applied to ANY type roof—concrete, iron, tin, slag, gravel, paper or felt—will make your worn and leaky roof like new. No heating of material—just trowel over the old surface as it comes from the drum. Will not run, check, crack or peel in hot summer or be affected by winter weather.

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Sirs: Please send more details on STONHARD PLASTIC and LIQUID ROOF RESURFACERS.

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Address .....

City .....Zone .....State .....

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STONHARD COMPANY

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Food Industry Aided by Chemistry

Contributions of chemical science to the production and handling of food are second in importance only to those of agriculture itself.

From the soil of the farm to the compressed dehydrated food tablet in the pocket of a soldier in a foxhole, chemistry performs vital services in the growing, processing and packaging of food for war.

At the very start chemistry enters the picture with seed disinfectants to protect against certain plant diseases. It is estimated that a quarter of all the food and fiber crops in the United States are so protected. Some of these bacterial enemies cause the seed to rot before it germinates. Others attack the sprouting seed and others produce "damping off" just after the seedling has pushed up through the ground. Watering the young plants with a chemical solution is another check against these early enemies.

To maintain the fertility of the soil and to increase crop yields, approximately 9,000,000 tons of commercial fertilizer are used in this country each year. Much of this contains nitrogen drawn out of the air by the chemical industry's high pressure plants, as well as super-phosphate prepared by treating phosphate rock with sulfuric acid, a staple product of chemistry.

Other chemical aids to the growing crops are sprays and dusts to check the ravages of insects and fungi, which cause an estimated annual crop loss of more than a half billion dollars, and new plant hormones to improve the root growth of seedlings, and keep fruit from falling off the branches before it is ripe.

These are illustrations of chemistry's direct help to the farmer; but less familiar, though no less important, are a variety of contributions which industrial chemistry makes farther along the line from the farm to the table.

Consider the baking of bread, which is the most universal item in the world's diet. It requires yeast, but not just any old yeast. So called "wild yeasts" that may be floating around cause "off" flavors in the bread. Therefore the bakers want "pedigreed" yeasts that have been reared under careful, controlled conditions. The culture medium on which these yeasts are grown is enriched by a chemical nutrient. It is pure white crystalline carbamide, or synthetic urea, made in a high-pressure plant from coal, air and water. Many tons of this yeast food are consumed each month in the country's largest yeast producing establishments in order that good bread may be made.

While the chemist aids nature on the one hand by nourishing the little yeast plants, he checks her at another point by delaying the growth of unwanted organisms, for example, the molds that flourish on bread in warm humid weather.

But molds are not always bad actors. There is the black fellow, Aspergillus niger, which is sometimes found on the surface of fruit or jelly. He isn't wanted there, but he is a valued little manufacturing chemist when given the right material to work with. For a niger has the power to convert simple sugars into citric acid, which is widely used in flavoring extracts, soft drinks and candies.

Just as synthetic urea is used to feed the baker's yeast, so it is employed to enrich the food of the Aspergillus mold in the citric acid fermentation plants. In one process the molds are grown on the surface of the corn sugar solution, to which the chemical nutrient has been added. More than 20,000,000 lbs of citric acid are normally produced in this country each year by the mold fermentation method.

Lactic acid is another widely used chemical product in the food industry. It is used in packing olives, where it retards molding and it imparts a tart flavor to many food products, including pickles, salad dressing, jams, jellies, candies, fruit ices and soft drinks. Lactic acid, too, is produced by a group of microscopic chemists, the beneficial lactic acid bacteria. They occur in milk, which is soured by the lactic acid they form. But in the commercial production of this important food ingredient the bacteria are put to work on other forms of carbohydrates, which they convert into the acid. Considerable amounts of phosphates are used in the manufacture of processed cheese.

Vitamins by the ton are being synthesized by the chemical industry, for fortification of foods and for administering in capsule form. Even the chickens are getting their share, for vitamin D is necessary for the prevention of rickets in young chicks and for insuring satisfactory egg yields and desirable hatching qualities in the eggs. "Delsterol" "D"-

Columbia FLOUR BLEND Sodium Bicarbonate never cakes —always flows freely. That's why it's ideal for blending with flours—why it enables users to maintain the uniformity essential to the success of their products.

Made to the highest standards, FLOUR BLEND is prepared with Columbia U.S.P. Sodium Bicarbonate and Tri-Calcium Phosphate. Supplied in a variety of sieve specifications to meet your requirements.

And for other uses, you'll find Columbia U.S.P. Sodium Bicarbonate meeting or surpassing every U.S.P. standard. In powdered or granular form.

Your tests will prove Columbia's claims. Samples of FLOUR BLEND or U. S. P. Sodium Bicarbonate will be furnished at no charge on request.

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activated animal sterol is widely used in the poultry field as a source of vitamin D, and is contributing to the farm production record.

The chemical industry contributes in countless other ways to the preparation of our foods. Certain dyes which are selected by the Pure Food and Drug Administration as being perfectly harmless to the system are used to color butter, candies, gelatine, etc. And synthetic flavorings are now in unusual demand because of the shortage of imported natural flavoring extracts. Among the most important of these are coumarin, which has a vanilla flavor, and methyl anthranilate, which tastes like grapes. Alcohol manufactured by the chemical industry is employed in the recovery of pectin, for jelly making and for medicinal use, from apples and other fruit.

Special alkaline cleaning agents with long names make short work of washing the equipment and utensils used in the food processing industries. Among these are trisodium phosphate, metasilicate of soda and tetra - sodium - pyrophosphate. The army uses quantities of these products in its dish-washing machines and to clean walls and floors of kitchens and barracks. Other chemicals are employed to sterilize equipment and to insure that the food products go out free from bacterial or other contamination.

Conserving the food until it is served at the table is obviously a big part of the food industry's job, and here again chemistry contributes. Many tons of ammonia, made by high-pressure synthesis out of the nitrogen of the air and the hydrogen of water, are used each year to manufacture ice as well as to create the low temperatures for quick-freezing foods and for holding foods in cold storage. Quick freezing is achieved by a variety of methods, including blasts of cold air, contact with cold plates, and dips or sprays of brine or sugar solution.

Another chemical product, a refrigerant, which is odorless, nontoxic and nonflammable, is widely employed in the delivery and grocery store retailing of the quick-frozen foods, as well as in many household refrigerators, in rural and suburban frozen food lockers and air-conditioning systems, including those which keep the air of food processing plants clean and comfortably cool.

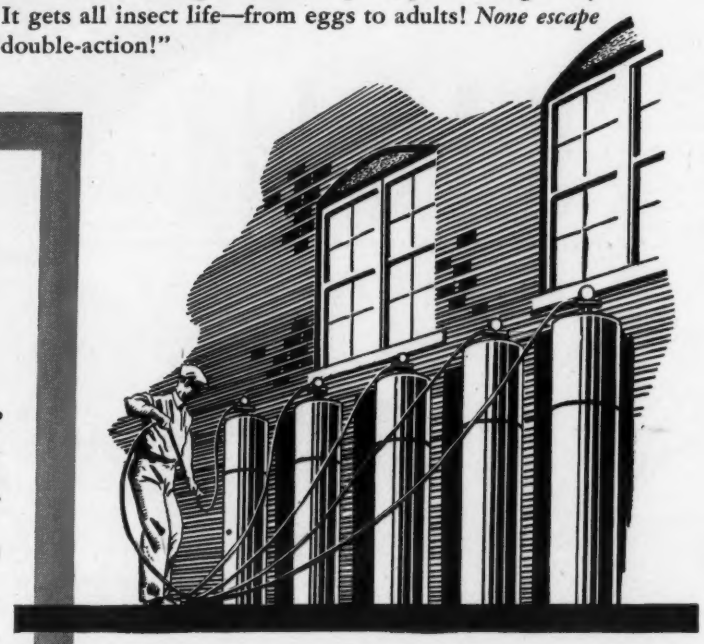
Finally, the packaging of food products has become a chemical problem, of particular importance in view of the wartime shortage of metals. Paper impregnated with various greaseproof materials, including sodium silicate and polyvinyl alcohol, is being employed here. Large quantities of sodium silicate adhesive are also used in the fabricating of boxboard. And cellophane has during the past year extended its usefulness into many new areas of the food field, where it has been a standard wrapping material for many years. By itself or combined with paperboard, cellophane is replacing metal cans in the packaging of shortening, frozen eggs, baking powder and other things. Its biggest job is in the protection of dehydrated foods, and more recently, compressed dehydrated foods, for shipment on lend-lease and for field rations for the Army.

As a postscript, the water in which food is cooked is made pure by chemical treatment. Alum is employed to clarify water, and as an aid to filtering. Chlorine or a combination of chlorine and ammonia are used to kill bacteria.

The "Double-Action" of LIQUID HCN

SPELLS SURE DEATH TO ALL INSECTS!

HCN fumigation has a "double-action" that virtually assures a complete kill of insect and rodent pests. When released from the cylinder, Liquid HCN *vaporizes rapidly!* This vapor is at first heavier than air and settles throughout the lower reaches of the floor area, of mill or warehouse or chamber. *THEN,* as it reaches room temperature, it *expands* and *rises* filling the entire space, penetrating every hidden crack and crevice. It gets all insect life—from eggs to adults! *None escape* its quick, clean, efficient "double-action!"



SEE FOR YOURSELF WHY FUMIGATION EXPERTS PREFER LIQUID HCN

1. "Double-action" of HCN fumigation steps up killing-power—is deadly to all insect life!
2. Yet is harmless to food products and equipment.
3. Fast action—permits short fumigation period and minimizes shutdowns.
4. HCN is economical, low concentrations of gas will give maximum kill.
5. Clean to use—no fuss or muss to clean up.
6. Used with equal facility to fumigate the smallest as well as the largest plants.

These are the reasons why leading Industrial Fumigation Engineers who specialize in all types of insect-control problems under all conditions prefer Liquid HCN. You can get the same extra margin of protection by specifying Liquid HCN on your next fumigation job! Let us recommend a competent fumigation engineer to give you an estimate for a planned program for complete control "tailored" to your requirements.

AMERICAN CYANAMID & CHEMICAL CORPORATION
Insecticide Department • (A Unit of American Cyanamid Company)
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.
Kansas City 6, Missouri • Azusa, California

SPECIFY THE FUMIGANT PREFERRED BY EXPERTS

LIQUID HCN

Enriched Flour

(Continued from page 7a.)

average, the same at the end of the test as at the beginning, while those on the Morris type of flour made an average gain of 6 grams."

A second test was conducted, using patent flour enriched at the present level. At the end of 60 days, the rats on the enriched flour had gained 12 grams while those on the whole wheat diet had gained 14 grams. Both types of flour constituted 30% of the total diet in this test.

At 50% levels, the rats on enriched flour showed better gains than those being fed whole wheat. The gains were about equal until the 36th day and at the end of 60 days the rats on the enriched flour diet had gained 48 grams as compared with gains of 43 grams for the rats on the whole wheat diet.

A third test was run, but with the supplements at the 40 and 50% levels, instead of at the 30% level. The test was allowed to run for 84 days and at the end of the test the animals on the enriched flour diet weighed 7 grams more than did those on the whole wheat diet.

"Neither the whole wheat or the enriched patent flour contained enough of all of the B complex vitamins to produce optimal growth," the authors assert. "The addition of thiamine, niacin and riboflavin definitely improved the nutritive value of patent flour sufficiently to make it equal to or better than whole wheat in promoting growth, depending upon the level fed."

Bags—an Implement of Victory

(Continued from page 6a.)

bag industry has received widespread recognition from government authorities for the development of multiwall paper bags to replace fabrics, wood and metals which are difficult to obtain under war conditions, as well as for acceleration of its production facilities.

Somewhere along the line from farmer to mess kit and dinner table, bags serve every soldier and every civilian every day. The military requirement almost exceeds imagination. It calls for enough bags to move three and one half pounds of the daily average of food consumed by every American soldier. It includes hundreds of millions of tiny bags to be packed with silica gel, a moisture absorbent included with all overseas shipments of machinery. It includes 11 50-lb flour bags each year for every five men stationed overseas.

On the home front, in 1943 alone, more than 380,000,000 square yards of cotton were needed for bags to pack feeds; more than 55,400,000 square yards of bags for fertilizer. Over-all demands of the flour industry required 272,900,000 square yards of cotton bags, while 163,000,000 yards went into the production of sugar bags.

The actual production figures speak louder of the cotton bag industry's tremendous wartime achievement than any words. In 1941, the industry consumed 844,000,000 square yards of cotton. Its 1943 demands of 1,416,000,000 yards represent a 73% step-up in production—tell the story of production almost doubled in the face of great wartime handicaps. For burlap the peak year was 1941, almost equalled in 1944, and paper has shown a steady uptrend to 391,000 tons in 1944, double the usage in 1940.

Production of cotton bags has been estimated at 674,000,000 bags in 1941; 956,000,000 bags in 1942, and 1,132,000,000 bags in 1943. No data at present are available on bags made from burlap and paper.

The Southern Research Laboratory, U. S. Department of Agriculture, provides these statistics, partially based on estimates from the War Production Board and from industry associations:

ESTIMATED QUANTITIES OF COTTON FABRIC, BURLAP AND PAPER USED IN BAGS DURING 1940-1944

	Cotton fabric		Burlap		Paper*	
Year—	Quantity Million yards	Index † %	Quantity Million yards	Index † %	Quantity 1,000 tons	Index † %
1940	819	100	600	100	195	100
1941	844	103	620	103	206	106
1942	1,196	146	306	51	280	144
1943	1,416	173	400	67	300	154
1944‡	1,180	144	619	103	391	201

*Multiwall bags only. †1940 equals 100. ‡Preliminary.

THE INDUSTRIAL FUMIGANT CO., INC.

Specialists in

FUMIGATION and PEST CONTROL FOR THE MILLER

National Organization. Complete and Up-to-Date Equipment. All Recognized Fumigants.

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MINNEAPOLIS OFFICE - - 216 Hodgson Building

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The primary purpose of an appraisal of your mill and elevator property is to provide a basis for the amount of insurance to be carried, and, in case of a fire, the appraisal serves as a basis for the amount of insurance to be paid.

Appraisals made by our trained and experienced engineers have never been successfully disputed in case of fire loss.

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☆ *Appraisers to the Milling and Grain Trade* ☆

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Designers and Engineers for Mills, Elevators and Feed Mills
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FULTON BAG & COTTON MILLS
Manufacturers Since 1870
Atlanta St. Louis Dallas Minneapolis New York New Orleans Kansas City, Kans.

How to Place Fire Extinguishers

Portable fire extinguishers should be placed where they are readily available and access to them is not likely to be cut off by fire.

When used to provide general protection for an area containing normal fire hazards, extinguishers should be so placed that at least one large or two small ones can be reached by traveling no more than 50 feet from any point in the area. Fewer extinguishers are required where the fire hazards are light, and more where they are severe.

When the extinguishers are used for safeguarding a specific fire hazard, they should be mounted near it, but not on or so close to the hazard that they will be involved if it catches fire. If the hazard is located in a relatively small room, it is good practice to mount the extinguishers either just inside or outside doorways leading into the room. Operators can easily get at extinguishers so placed and have a safe line of retreat in case of necessity.

Extinguishers may be mounted on columns or walls, with hangers, brackets or shelves as supports. The tops of easily handled units should not be more than five feet from the floor; with heavy units, this distance should not exceed three and one half feet.

Extinguishers should be placed where they can be plainly seen. When they are wholly or partly concealed, their locations should be marked with conspicuous signs.

Nothing that might interfere with the accessibility of an extinguisher should be placed under or near it. All extinguisher locations should be checked at least once a day, and any obstructions found should be removed immediately.

★ ★ ★

Sack Cloth for Madame

By Ruth Bowman

THERE was a time, long, long ago, when a feed store was just a feed store. But that was back in the good old days when a man was a man and a cow was a cow. Those things are gone forever. Well, a cow may still be a cow but a feed store has turned into a piece goods department and as for a man, well, I would hate to say.

There was a time when any he man could walk into a feed store, call for a sack of feed and depart as easy as that and with all his self respect too, but no more. Now his wife sends him and not only so; she fills him with instructions and dire warnings.

"I told you last time that I do not like pink. I hate it. And I do not want any more of those old flowers like you always get. Everybody has them and they look just like a sack. And you tell Paris that the next time he sends me a sack with a hole in it you are going to bring it right back."

"Well, yes, I know the chickens still have feed but it won't last forever and I need my dress. How do you think I can go to the shower without something to wear?"

At last the poor man makes his way to town. He postpones his trip to the feed store as long as possible. He gets a cup of coffee at Lucy's and stands around on the street as long as it seems decent to do so. But all the time he knows it will have to come. It reminds him of the time he made himself go to the dentist.

He might as well start. He sees Fred standing in the doorway before he gets there. He sees the brightly painted doorway, and subconsciously thinks that it is an appropriate sign for a dress shop.

Meekly he enters the shop. "What do you say?" The voice startles him.

"Pink," he stammers weakly, then hastily tries to unsay it. It is not pink that he wants at all. His wife hates pink, but he had to say something.

Finally he remembers that he is buying feed—chicken feed. "EGG MASH," he says loudly, too loudly; but somehow it seems to restore his manhood to hear himself say it.

Fred nonchalantly guides him into the other department and again the man's spirit sinks. There are those rows and rows of sacks, pink and red and purple and green and yellow. He sees only the number. The colors mean nothing to him.

He believes he will relie on chance —yes, he would take a chance.

"Just any of them," he says boldly, but his heart feels faint as he watches his wife's next dress wheeled away.

He is faint when he reaches home too and his wife yells: "Purple! Me in a purple dress! And me, fat me, in those huge flowers! I am much too fat!"

Poor man! He is speechless again but not thoughtless. He sits and tries to figure it out. Since when, he wonders, do women prefer to buy dresses in a feed store. And why should a dress look better for having been grimy with chicken feed?

PFIZER
BI-CAP
FLOUR ENRICHMENT CONCENTRATES

Pfizer Bi-Cap Concentrates for flour enrichment meet the recommendations of the Millers National Federation as regards composition, allowing an ample safety factor. They are finely-milled and of uniform particle size and are designed especially to facilitate even distribution in the flour.

Three types are available to meet the requirements of the individual miller:—

TYPE A — Single strength. Prepared with Sodium Iron Pyrophosphate as the source of iron.

TYPE B — Single strength. Prepared with Reduced Iron (Ferrum Reductum).

TYPE C — Double strength. Prepared with Reduced Iron (Ferrum Reductum).

For those millers who prefer to prepare their own concentrates, we offer the pure, crystalline Vitamins—Thiamin Hydrochloride (Vitamin B_1), Riboflavin (Vitamin B_2), and Niacin (Nicotinic Acid).

Chemicals For Those Who Serve Man's Well-Being

THE WORLD'S LARGEST PFIZER QUALITY PRODUCER OF PENICILLIN

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MANUFACTURING CHEMISTS • ESTABLISHED 1849
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444 WEST GRAND AVE., CHICAGO 10, ILL.

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

Dig Deep in the Heart of Taxes

☆ ☆ ☆

By Arthur Roberts

ACCURATE accounting is essential to accurate tax reporting. However, even where accounting is accurate, tax savings are not always effected because the taxpayer does not take all permissible deductions or he interprets certain phases of the law in a way that increases his tax.

In general, the tax laws are concerned with losses and gains incurred during the taxable year. The expenses and liabilities of one year cannot be used to reduce the income of a subsequent year. Depreciation rates should be fixed carefully because the taxpayer cannot take advantage in later years of prior failure to take ample depreciation. If you short change yourself on depreciation you pay more tax and you can't recover in later years when you find that the rate should be adjusted upward. The straight line method of fixing the depreciation rate is easiest to compute and used by most taxpayers. You figure the rate on original cost divided by the years of useful life, not necessarily mechanical usefulness, but profitable usefulness. Scrap value should be considered when setting the rate. The taxpayer may increase the rate at any time if he can justify it and this increase cannot cover short calculations on deductions in prior years, but must represent increased depreciation on equipment during the year for which the return is filed.

Taxpayers often lose out on a deduction for bad debts because they do not deduct in the year the debt is ascertained worthless. If it can be shown that you knew a debt was worthless in a year prior to the one in which you list it for deduction, it may not be allowed. Taxpayers on an accrual basis may report bad debts by deducting the debts as they become worthless or by deducting a reasonable sum set up as a reserve for bad debts, usually computed on a percentage basis determined from experience figures and based upon credit sales.

If bad debts in the past have averaged 2% of credit sales and credit sales in a taxable year were $4,000, then $80 should be a reasonable reserve. The taxpayer doing business on a cash basis cannot use the reserve method. If a specific debt is partially worthless, that portion of the debt may be deducted within the taxable year. If the debt may become worthless in a subsequent year, the taxpayer may wait until that time to take the deduction.

Nonbusiness debts must be wholly uncollectible to be deductible. No deduction is allowed for partial worthlessness. A nonbusiness bad debt is considered a short term capital loss the same as a loss on a worthless security. The amount of nonbusiness bad debts deductible is limited in the same way as a loss from the sale of a capital asset. Nonbusiness expenses are deductible providing these expenses are incurred in connection with income that will be taxable, whether the income is received during the current taxable year or not.

A taxpayer using the reserve method of handling bad debts should credit the reserve if a bad debt is subsequently paid. He need not report this recovery as income. If the bad debt was a direct charge off, and he collects subsequently, the taxpayer must report the recovery as income in the year received providing its deduction at the time it was ascertained worthless yielded a tax benefit. In other words, if the taxpayer writes off a bad debt in a loss year and this deduction did not influence the loss he need not report subsequent recovery as income. Say a taxpayer had a loss in taxable year, $1,000 in all, $200 of which was a bad debt deduction, he would have lost $800 without this deduction and not paid a tax anyhow, so he got no benefit for the bad debt charge off and he need not report its recovery as income later.

Inventory, unless calculated correctly, may increase the tax payment. Take inventory at cost or market, whichever is lower. If the inventory is calculated too high, you pay more tax. There are numerous ways of figuring inventory but cost or market, whichever is lower, will give the best results in this field.

Losses arising from fire, theft or other casualty are deductible in the year they occurred providing they are not covered by insurance. If a loss is only partially covered, the excess loss is deductible, but this expense may disappear under the method by which

You'll *profit* by using the sales *power* of Cotton Bags!

To millions of American housewives, a product packaged in cotton has a definite *plus* value. A cotton bag to them is not just a container. It is an article of value and utility that has exciting usefulness long after its contents have been used!

IT'S SMART TO USE THE SALES APPEAL OF COTTON BAGS!

When women face a choice of brands, the cotton bag often is the trick that prompts decision. *Women favor products packaged in cotton.*

Day after day, in millions of American homes, nimble fingers with needle and thread work miracles with cotton bags. They make a multitude of clever useful things . . . from bibs to bedspreads . . . diapers to doll clothes . . . dresses to draperies.

National interest in this thrifty and entertaining practice is constantly being stimulated by Cotton's program of practical promotion. In farm papers . . . in home economics publications . . . in magazines for teachers . . . (with more than 8,000,000 circulation) . . . thrifty uses for emptied cotton bags are being urged.

Already more than a MILLION copies of the clever practical book, "A BAG OF TRICKS FOR HOME SEWING", have been placed in the hands of eager women. You can take advantage of this interest by using this book, with your own imprint, to turn a neat sales trick for your product.

IT'S AMAZING!

READ THE STORY OF

A MILLION BOOKS!

Each week, by the thousands, requests pour in for copies of "A BAG OF TRICKS". Eager women want the clever, helpful information the book gives. Home economics groups seek its suggestions. Teachers are using it in classrooms! For not only does it bring IDEAS, but it promotes THRIFT!

This deluge of active interest from women illustrates the tremendous appeal of sewing with cotton bags. To women a cotton bag is *not* just a container. It represents a *plus value* for the products inside it.

You Can Profit By Using This Book

Many manufacturers already are using this book to increase consumer sales appeal and build dealer good will for their products. Ask your bag supplier, or write us, for a free copy and details of the plan for making this amazing book do sales tricks for you.

NATIONAL COTTON COUNCIL OF AMERICA

MEMPHIS (1), TENNESSEE DEPT. 50, P. O. BOX 18

the tax office permits the deduction. You must take depreciation and salvage value into consideration and when this is done, the value of a property may be reduced to the point where there is no excess. It all depends upon the case, but the taxpayer should not forget this angle in the event he must write off an uninsured loss. If he has been taking depreciation on the property, he has already been given credit for certain loss in value by the tax office, so he cannot claim it again.

Advertising is deductible as an expense if the outlay is reasonable and its ratio to sales is not out of line with experience figures or general trade practice. The test is whether the sum spent for advertising is an attempt to avoid proper tax. In the high tax brackets, a concern may get its advertising for probably 30c on the dollar, because if they did not advertise they would have to give the remainder to the government as tax and this is what the treasury department won't permit. However, the treasury recognizes that even if a concern is working on war work, which can be gotten without advertising, it must maintain good will for its peacetime products; therefore it permits a reasonable deduction for advertising.

Many concerns during the last war quit advertising and found to their dismay that the public had forgotten them when peace came. This lesson sunk in and all progressive businessmen are doing some advertising today. Incidentally, the high tax rates have cut the cost of advertising for all. The taxpayer who has discontinued advertising during the war because he can get all the business he wants without advertising should remember that it always pays to advertise, that if he did not advertise and take a deduction for this expense, he would pay that much more tax, that the net cost of advertising to him is in the price he pays for white space less the additional tax he would pay if he didn't advertise, that he stands a chance of losing prestige during the war years.

Some taxpayers are still handling withholdings so that they are not readily checkable, which is bad business, even though their returns to the collector are accurate. The withholding tax will probably be permanent and the more the records pile up with the years, the more difficult it will be to audit them. So, systematize and simplify the routine as much as possible with due regard for accuracy, of course.

A check stub detailing deductions aids accuracy. Duplicate listings on the face of the check, which automatically provides a receipt for withholdings, are a valuable record in controversy stemming from employee or government. Checks are easier to audit and give definite proof of payroll transactions. Ask your banker about such checks. Cash payment of wages is unwise today.

The tax bill of 1945 prescribes new rates of withholding taxes but it is not necessary to change the payroll system to record accurately as long as you use an adequate system now. Taxpayers who use old fashioned systems for recording withholdings should modernize with payroll forms procurable at any stationer specially designed for recording the various tax deductions.

There are certain borderline cases in the tax law where a transaction may be considered in more ways than one. Wherever a transaction may be legally interpreted in favor of the taxpayer, it is permissible to take that interpretation. For example, does an outlay cover a repair or an improvement? The former is an expense, the latter an increase in asset value, the former deductible, the latter not. Some taxpayers consider all repairs as improvements and this increases the tax. If an outgo really increases the value of an asset, it is an improvement and not deductible but if it replaces old property or wear and tear, it is usually a repair and deductible.

Finally, remember that the law permits the taxpayer to carry over and carry back operating losses for two years. A few years back a taxpayer could be taxed on a loss. Say he earned $8,000 in one year and lost $10,000 the next year. Under the law at that time he was taxed on the gain and paid no tax on the loss, yet, in the two years he really lost $2,000 and was taxed on an $8,000 gain. To partially rectify this injustice, the law, from 1940, permits a taxpayer to take such losses into consideration when filing a return but he cannot get credit for losses going back more than two years or carried forward more than two years. Losses not absorbed in this period come out of the taxpayer's pocket.

Say your losses and income for five years were as follows:

1943 net income	$3,000
1944 net income	2,000
1945 net loss	4,000
1946 net loss	2,000
1947 net income	8,000

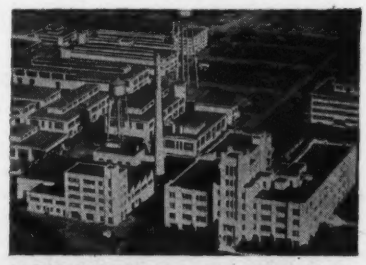
Carry back the $4,000 net loss in 1945 to 1944 and 1943, leaving $1,000 unabsorbed income in 1944. File a claim for credit or refund of taxes overpaid in these years. You lose $2,000 in 1946, so take that unabsorbed income for 1944, ($1,000), and file another claim for credit or refund of taxes overpaid. You still have $1,000 loss not absorbed for 1946, but you have an income of $8,000 in 1947,

TOMORROW: SHOPPERS WILL DEMAND FLOUR ENRICHMENT

That War Food Order No. 1 has for two years, now, made enrichment of bakers' white bread and rolls mandatory—and that it appears likely to remain in force for some time yet—tells only two parts of a four-part story vital to you.

Part three: Housewives, returning from war work, men returning from the Service, have experienced the benefits of improved nutrition, have learned the values in food enrichment. They are going to insist on enriched bread, even without Government orders, and they are also going to insist on enriched family flour.

Part four—*which is up to you:* The flour milling industry today, through vitamin enrichment, is in the fortunate position of leadership. Preserve that leadership through continuing *emphasis* on enrichment. Enrich ALL of your family flour.



HOFFMANN-LA ROCHE, INC.
Vitamin Division, Nutley 10, N. J.

Something new and better in products or packages always attracts attention . . . and customers.

In bags for packaging your flour and feed products, Percy Kent has been first for 60 years with many new designs and sales-building ideas. Among the PK innovations are Ken-Prints, Ken-Stripes, Tint-Sax, improved printing methods including perfected wash-out inks, and other quality textile bag developments.

And while an accelerated production pace must still be the first concern of the entire milling industry until the war is won, we're not forgetting the PK policy of *"Always Something New."* You can be certain that Percy Kent will be ready with new and better bag designs, materials, and merchandising plans, for the aggressive miller who looks toward tomorrow's highly competitive market.

SPECIALISTS IN COTTON BAGS SINCE 1885

PERCY KENT BAG COMPANY, INC.

KANSAS CITY • BUFFALO • NEW YORK • WICHITA • MINNEAPOLIS • CHICAGO • OKLAHOMA CITY

so carry this $1,000 loss over to 1947, reducing income to 7,000 taxable dollars.

Taxpayers may effect substantial economies by taking full advantage of these provisions and it may be that in the reconversion period or after the postwar buying wave has begun to recede, businessmen will suffer loss years, in which event they can reduce tax expense or get additional working capital by filing claims for credit or refund of taxes.

SIMPLE VITAMIN TEST

A simple and rapid method for quantitative determinations of thiamine and riboflavin in wheat grains is described in an article in a recent issue of Science. The article, written by Drs. Somers and Coolidge of the federal plant, soil and nutrition laboratory at Ithaca, N. Y., also points out that relatively high concentrations of the two vitamins occur at the base of the crease in the wheat berry.

WET CORN—Typical of the large quantity of high moisture corn piled on the ground in some areas of the corn belt is this photograph of 24,000 bus near an elevator at Shelton, Neb. The elevator is full. Some of the wet grain was piled in wire cribs, but much of it was merely dumped from trucks into huge mounds. It is estimated that 100,000,000 bus of corn were thus subjected to the elements in Nebraska alone. Spoilage is expected to run high.

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GRIT GAUZE

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Permaflux SPOUT MAGNETS
HAVE DOUBLE GAP!

NIAGARA

Magnet open for cleaning

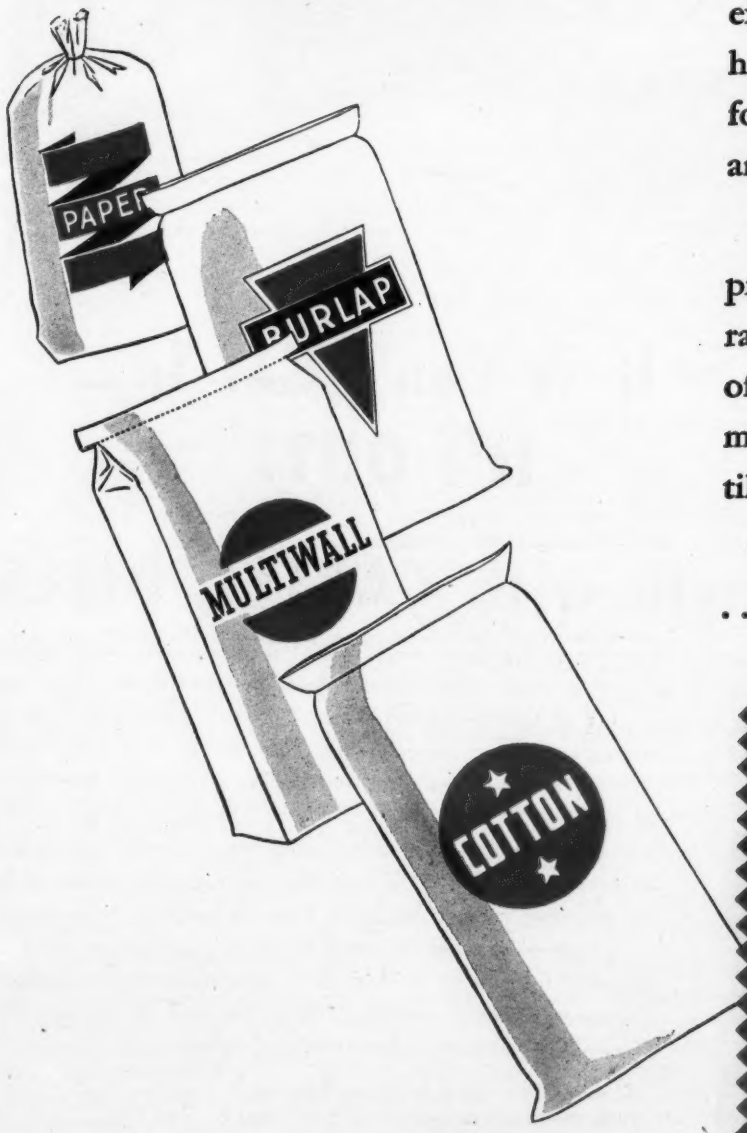
That is, TWO strong poles of force over which the material must pass, thereby doubly insuring stopping and holding contaminating metal. Two magnets in one; TWICE THE EFFICIENCY OF SINGLE MAGNETS.

PERMAFLUX magnets are powerful, and stay that way. As an example, it requires a pull of 16 lbs. to release a 1 inch diameter round steel ball adhering to magnetic face.

PERMAFLUX pays dividends by eliminating hazards of explosions and fire due to tramp metal. In addition, savings are realized in costs of damage to machinery and labor time lost in maintenance and repair.

THE RICHMOND MFG. CO.
29 Gooding St., Lockport, N. Y.

Whatever's the BEST BAG FOR YOUR USE ...we make it!



East Pepperell, Mass.

WHEN you buy your flour bags from Bemis, among the important advantages you enjoy is this: You can buy whatever type is best for your particular use—cotton, paper, multiwall, burlap or waterproof.

Bemis is a leading producer of *all* types of flour bags and consequently has no reason to high-pressure you toward any one type. We have no favorites. If our experienced packaging specialists can help you to determine which is the best for your use, you may be sure that their analysis and advice will be unbiased.

Suppose, for instance, a change in your product or in handling conditions warrants switching from some other type of bag to multiwall paper bags. We make multiwall paper, as well as textile, bags—so your interest is ours, too.

Whatever's the *best bag for your use* ...we make it.

BEMIS BAGS

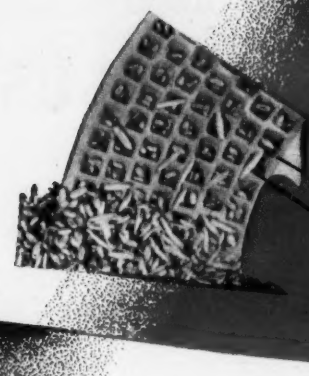
BEMIS BRO. BAG CO.

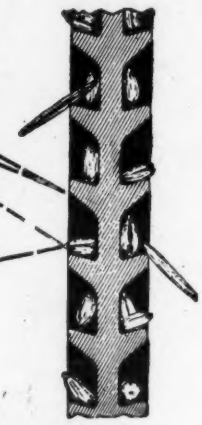
OFFICES Baltimore • Boston • Brooklyn • Buffalo • Charlotte Chicago • Denver • Detroit • East Pepperell • Houston • Indianapolis Kansas City • Los Angeles • Louisville • Memphis • Minneapolis Mobile • New Orleans • New York City • Norfolk • Oklahoma City Omaha • Peoria • St. Helens, Ore. • St. Louis • Salina • Salt Lake City San Francisco • Seattle • Wichita • Wilmington, Calif.

BETTER BAGS SINCE 1858

How Long Is an OAT?

Answer: It's Too Long to Fit into a Carter Disc Wheat Pocket!

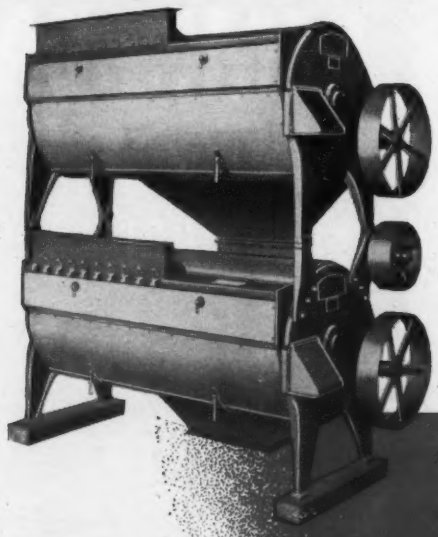




If It Can't Get In— It's OUT!

Separate by Length with CARTER DISCS

Nothing could be simpler or more effective than the Carter Disc method of separating oats from wheat. Oats are longer than wheat. Nature made them that way. Being longer, oats are unable to enter the pockets in a Carter Wheat Disc. These pockets pick up the wheat but reject the oats, large barley, straw joints and other material which is longer than the wheat. The result is a clean-cut separation accurately performed at low cost! Just as oats and other longer material can be separated on a basis of length differences—cockle and other shorter foreign material can also be removed from wheat by the disc method. Carter Disc Separators, individually or in series, can be adapted to meet the requirements of any mill both as to capacity and separations desired. Don't put up with oat or cockle trouble. Incorporate Carter Disc Separators in your wheat cleaning system.

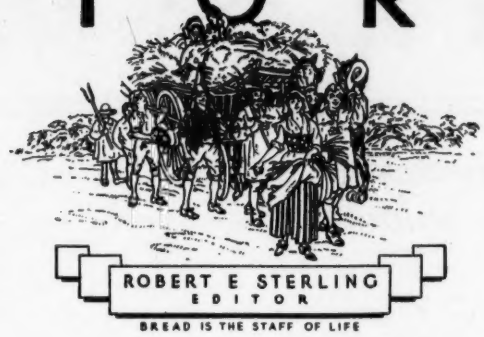


Shown at left are two Carter Disc Oat Machines mounted one over the other.

HART-CARTER COMPANY

680 19th Avenue N. E. Minneapolis 13, Minnesota

EDITORIAL



THE COLONEL'S TANTRUM

MAYBE it was just a wartime jitter, to be charitably brushed off, but while the heat engendered by Col. J. Monroe Johnson's tantrum is still on it is hard to see how he helped the boxcar situation by his intemperate letter to the Kansas City Board of Trade, full text of which is published elsewhere in this issue, along with the trade recommendations for preserving the great food reserves of the middle west which he found so "presumptuous."

It is in keeping with the colonel's bad temper that he should have singled out but one of the many signers of the recommendations for his bureaucratic displeasure. The program submitted to the colonel and others was endorsed by straight thinking representatives of every major grain and milling element in the southwest. It was then handled by E. R. Jessen, president of the Kansas City Board of Trade, who signed and fully subscribes to the plans suggested in the communication, thus qualifying himself as the colonel's special target for abuse.

The statistics of the grain and milling situation in the middle west were given to Col. Johnson effectively and clearly both in the letter to which he takes such violent exception and in a masterful resume of the problem directed to him April 5 by Senator Clyde M. Reed of Kansas. For those of us who are not so deeply versed in transportation but who watch carefully for honest and fair appraisal of situations, we will place the senator's statement of boxcar affairs up against the colonel's and let the best man win. It is enough for us to repeat the obvious facts:

Western elevators are full of wheat and corn. Corn and sorghum grains are rotting on the ground. Flour mills are running out of wheat. The world is hungry and our government is trying to press what surplus food we have into humanitarian use. Carloadings are not moving these grains into food channels fast enough. Wheat loadings for export are less than a third of requirements. Flour mills are shutting down for want of cars while the army appeals for more and more flour, and at a time when the stocks of wheat are enormous. Another tremendous crop is in prospect.

In the light of these simple but imperative facts, known to the colonel as well as to every man even remotely connected with the grain industries, would it not be entirely in order for grain men and millers to make even presumptuous recommendations?

They do not presume too much upon the rights and prerogatives of good citizens who reach out for any hand and to any device that seems likely to help in averting national calamity.

• • •

WANTED: A FARM POLICY

MANY a prize contest has been set up by book and magazine publishers to coax into being "the great American novel." But if such a Messianic piece of literature has been born it is not yet recognized. Now the technique is to be applied to finding a farm price policy. Hitherto our research in this field has been almost purely political, and our searching has been done largely with the aid of the Diogenes lantern of congressional economists.

The new venture is privately conceived. An anonymous donor to the American Farm Economic Association has made available $12,500 to be split up into prizes graduated upward from $250 to $5,000. This money will go to winners of an essay contest designed to find "a price policy for agriculture, consistent with economic progress, that will promote adequate and more stable income from farming." It is specified that proposals should be "easy to understand and simple to administer; sufficiently flexible to reflect changes in cost and demand conditions for any farm commodity, and so designed that it will be possible for consumers, as well as producers, to share in the benefits of increased production." No trick at all!

All citizens of the United States of America (even congressmen and bureaucrats) are eligible to compete (except those in charge of the contest and the judges, one of whom is Chester Davis, former head of the War Food Administration). Seems like easy money.

• • •

IN THE SILK HAT ERA

LEGENDARY was the silk hat of the late William M. Read, pioneer in the British flour importing trade, whose recent death at the age of 86 is chronicled elsewhere in this issue. He is reputed to have been one of the last of his commercial fraternity to relinquish wearing such headgear on 'Change, where he had been, by the time of his retirement in 1933, a familiar figure for nearly six decades.

The persistence of the silk hat tells us something of the character of its wearer. Mr. Read was no less reluctant to give it up than he was to acquiesce in the changing conditions of world trade that brought down the business edifice he was so greatly instrumental in building up. His commercial life was virtually coterminous with the British trade in American flour which began to reach full growth in the 80's and was extinguished by the gradual development (and "rationalization") of Britain's flour milling industry and the ultimate coup de grace, following World War I, of the British imperial preference for dominion products. The middle years of that period, to make a further figure of the sartorial symbol, comprised the silk hat era of the American export trade in flour.

When Mr. Read began his apprenticeship in the flour business in 1875 Britain's commerce with the United States in this commodity was just about to emerge from the insignificant stature it had assumed up to that time. The firm with which he was connected was among the first to specialize in trans-Atlantic imports. The fame of Minnesota, and later of Kansas flours, was being bruited abroad, and by the early nineties Britain's purchases from the United States had reached their peak of approximately 10,000,000 bbls a year. This enormous business continued into the early years of the present century, then steadily declined (save for the war years 1918 and 1919) to an insignificant trickle in the thirties and to complete extinction on the eve of World War II. Mr. Read's retirement in 1933 was coincidental with this denouement.

Twice Mr. Read served as president of the London Flour Trade Association. As such, upon the first occasion in 1891, he welcomed and entertained the "Millers' Excursion to Great Britain" organized and conducted by the late William C. Edgar of The Northwestern Miller. This was an exploratory visit of 56 representatives of the American flour exporting fraternity, out of which came a materially expanded and regularized trade, along with a crop of personal friendships and business allegiances that was to be fruitful and enduring.

The personality of Mr. Read was dominant in this entente. His acquaintance was wide and the favor he enjoyed was deep. Attesting his charm of manner, our London manager, Mr. Raikes, said of him in the year of his retirement: "His kindly, genial disposition makes meeting with him and talking with him a real pleasure. It can well be said of him that he has not an enemy in the world, and his fair, straightforward methods of business have made him highly respected and esteemed by his selling connections and buyers alike. There is a twinkle in his eye, which tells of fun and humor, and this cheery view of life has carried him through many difficulties. It is not likely to forsake him."

• • •

Congress is not yet quite sure of itself on the subject of free lunches for school children. The other day when Marvin Jones, war food administrator, finished his argument for a permanent child-feeding policy, the House could find only a margin of one vote in favor of an appropriation of $50,000,000 for the fiscal year. But bureaucratic Washington seems absolutely unanimous and sure of itself on this phase of the postwar social revolution. In his valedictory report, James F. Byrnes, director of the Office of War Mobilization and Reconversion, recommended legislation "which will bring about an orderly expansion of the present school lunch program, to the end that all grade and high school children (at least 20,000,000) can participate within the next two or three years." This would quadruple the present program.

• • •

BUREAUCRATIC COPS

GOVERNMENT regulations don't regulate all by themselves. Human nature being what it is, even the best of controls in furtherance of the best of causes must have a policeman in the background. This is the inescapable logic behind the War Food Administration's miniature FBI designed to help prevent speculation, profiteering and fraud in connection with WFA transactions and regulations affecting food commodities.

The WFA police force has plenty of company. Almost all the innumerable federal boards and authorities have their investigators, most of them lawyers with a talent for such work, but somewhere along the line of enforcement even the most insistent lawyer is likely to have need of a cop. In fact, the more rules and regulations a government agency assumes, either with or without benefit of Congress, the greater the police power it must possess. If the law, statutory or delegated, is to reach into every nook and cranny of life, we must be reconciled to what at best we may only hope will be a benevolent gestapo.

Why bring the matter up at all? Solely because it is well for us not to overlook or to forget what is happening; and so that it may sober the social and political inebriation of those who not only would cling to the war-born regulatory authorities we have but add others to them.

Canadian

CONDUCTED BY A. H. BAILEY
Manager Canadian Branch
Lumsden Building Toronto 2, Ontario
Cable Address, "Palmking"

Grain Board Official Anticipates Liberal Western Canada Shipments

Vancouver, B. C. — Grain from western Canada will move this year through this port to New Zealand, United Kingdom and the Continent as well as probably to India and South Africa. At least 6,000,000 bus of sacked wheat is sure to go from here to New Zealand. Movement of wheat to other foreign destinations will depend on available tonnage.

This statement was made here during the week by George McIvor, chairman of the Canada Wheat Board, during his visit on the board for a meeting with the advisory committee.

"We are trying to obtain as much tonnage for the Pacific coast outlets as possible," he added, pointing out that both the board and the advisory committee, which is made up of six representatives of the producers and five representing other basic branches of the grain industry, are agreed on this.

Mr. McIvor said he hoped for improvement in the supply of available ships as they then can take advantage of the shorter western haulage, thus relieving the transportation strain inland.

The news regarding the New Zealand and India shipments was not unexpected here, but this is the first time that a responsible grain board official has intimated that the United Kingdom and Continent as well as South Africa might be served from here this year.

Members of the advisory committee which attended the local conference included J. Wesson of Regina of the Saskatchewan Wheat Pool; D. Campbell of Montreal, representing St. Lawrence Flour Mills; A. Reid of Winnipeg; T. Roy of Montreal, former manager of the Co-operative of Quebec; P. Farnals, former head of the Alberta Union of Municipalities; R. Brown of Pilot Mound, head of the United Grain Growers; J. McGowan of the Saskatchewan Wheat Producers; L. Hutchinson of Calgary, former chairman of the Alberta Wheat Pool; F. Pettypiece of Ontario Producers; F. H. Clendenning of Vancouver, representing the British Ministry of Shipping, and G. W. Shinn of Winnipeg, secretary of the committee.

Board members at the meeting included Ray E. Lee of the Vancouver office; A. Millard of Calgary; Commissioner C. C. Huntting, T. W. Grindley, secretary of the board, and C. B. Davidson, executive assistant.

The Canada Wheat Board handles all domestic and foreign sales of Canada's grain crop.

The 1945-46 program, now under discussion at the various board-committee meetings, was announced last month by the minister of trade and commerce. It fixed the initial wheat price at $1.25 in store at Port Arthur or Vancouver and limited producers to a maximum of 14 bus of wheat to the acre per authorized acre. Minimum prices and advance equalization will be continued for oats and barley. The flax price is guaranteed at $2.75 bu for No. 1.

——BREAD IS THE STAFF OF LIFE——

CANADIAN ASSIGNMENT—Frank J. Sullivan, left, manager of the Toronto branch of the Strong-Scott Manufacturing Co., Ltd., is justly proud of his son, Paul J., who is a Flight Lieutenant in the Royal Canadian Air Force. Lt. Sullivan has been in service since early in the war, fighting most of the time from bases in England and the Middle East. At present he is stationed at Penfield Ridge, New Brunswick, as a member of the air training staff. When the Canadian assignment is completed he expects to return overseas. His father has had long and active service in the flour milling machinery trade of Canada. Prior to taking over the management at Toronto he was stationed in western Canada with headquarters in Winnipeg. Much of the growth which brought the milling industry of Canada to its present state of efficiency took place during Mr. Sullivan's period of service.

ONTARIO MILLING WHEAT SCARCE AS FARMERS FEED

Toronto, Ont.—According to a recent report of the Dominion Bureau of Statistics, only 5,200,000 bus of Ontario winter wheat out of a crop of 20,900,000 had been delivered up to the end of December. Millers of soft wheat flour have had difficulty in securing adequate supplies of grain and the abnormally heavy snowfall last winter did not help. Many farmers apparently prefer to feed their winter wheat rather than sell it. The winter wheat crop was exceptionally poor in 1943 and as a result only 1,700,000 bus were milled. The following table shows the millings of winter wheat during the past six years:

	Bus.
1943-44	1,732,654
1942-43	5,120,631
1941-42	3,962,862
1940-41	5,129,701
1939-40	4,716,754
1938-39	3,213,687

Millings for the first six months of 1944-45 amounted to 2,700,000 bus.

Prices for winter wheat are at ceiling level which is $1.26 bu, delivered Montreal, basis domestic freight rates. Farmers are receiving an average price of $1.08 bu at the farm.

A system of export permits and an equalization fund has been set up and has been operative since July 1, 1944, for Ontario winter wheat and flour. This plan is similar to that in effect for western oats and barley and is intended to remove the difference between export and domestic prices. Any moneys accumulated in the fund from the sale of export permits are to be distributed to those producers who have delivered Ontario winter wheat to a dealer.

The export of whole Ontario wheat was prohibited by an order of the Canadian Wheat Board which was issued on March 13.

——BREAD IS THE STAFF OF LIFE——

BOARD TIGHTENS BARLEY, OATS PERMITS

Winnipeg, Man.—Except under exceptional circumstances, on and after May 1, 1945, no feed purchase permits will be issued authorizing the purchase of oats and/or barley for the balance of the present crop year up to and including July 31, according to the latest announcement by the Canadian Wheat Board. Producers or feeders who are not holders of either a producer's permit or a feed purchase permit and who will require a permit to purchase oats and/or barley to be used as feed or seed for the balance of the crop year must therefore apply for same immediately.

GOOD RAINS ALLAY FEARS FOR ONTARIO WHEAT CROP

Toronto, Ont.—Fears that the winter wheat crop of Ontario would suffer damage from drouth have been allayed during the past week. Recent heavy rains have put an end to this anxiety. This crop came through the winter in excellent condition. It had a good covering of snow from early in December and no thawing and freezing until the snow went away and mild weather set in.

Some fear was expressed that the early spring-like weather would produce too rapid growth and without rains the wheat would suffer from lack of moisture. It was remembered that the fall had been an unusually dry one and, although there was heavy snow during the winter, this was quickly absorbed when it started to melt because there was no frost in the ground.

The heavy rains now being experienced should provide abundant moisture and given equally favorable weather in the later growing stages, this crop should turn out well.

February Flour Output in Canada Drops to Lowest Crop Year Level

Toronto, Ont.—Flour production in Canadian mills in February was the lowest of any month in the current crop year, amounting to 1,892,435 bbls, compared with 2,087,705 in the corresponding month last year. Output in the seven months ending with February totalled 14,333,799 bbls as against 14,498,856 in the same period of 1943-44. Although production was down exports were higher in February, totalling 1,031,670 bbls, compared with 854,272 in February last year. Exports in the seven months ending with February amounted to 7,155,363 bbls as against 6,788,847 in the same period of preceding year.

Of February's production of flour, 100,784 bbls were soft winters as compared with a production of 16,640 in that month a year ago. The output of winter wheat flour in the seven months ending February was 637,872 bbls as against 240,039 in the same period of 1943-44. The small production of this kind of flour last year was the result of a short crop of winter wheat. This year's grindings are about normal.

The output of millfeed for the seven months of the crop year ending with February totalled 476,571 tons, compared with 475,787 in the same month of previous year. Nearly all the millfeed produced by Canadian mills is consumed in home markets. Exports are rigidly restricted and amount to less than 5% of output.

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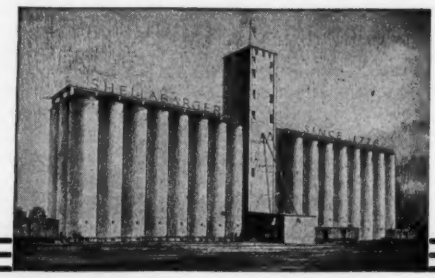

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FROM THE MANAGING EDITOR'S SIFTER

By Carroll K. Michener

WORLD WAR I'S FOOD CRISIS.—The most serious crisis faced by the U. S. Food Administration during the whole period of its operation in World War I seems to have been the wheat shortage of the season of 1917-18. Throughout the northern hemisphere disastrous crop failures occurred in 1917. Our own crop, following the exceedingly short crop of the previous year, was only sufficient to meet normal requirements for home consumption and seed. France and England, which usually produced only about one half the wheat they consumed, had huge crop losses, and their total production was considerably less than one third of their normal consumption.

There was an abundant surplus of wheat in Australia, but on account of the tremendous submarine losses and the resulting acute shortage of ocean tonnage, it was impossible to send ships such a great distance without the complete abandonment of the United States military program for transporting troops to Europe.

The allied governments effected every economy possible in their consumption of wheat. The largest practical proportion of substitutes was mixed with flour, and milling extraction was set at a very high percentage. The allied peoples of Europe were put on a limited flour allowance, and even the soldiers in the French army were compelled to subsist on extremely short rations of bread of the poorest quality.

● **The "Fifty-Fifty" Rule.**—By the beginning of 1918 it was seen that all the wheat-saving plans adopted up to that point were insufficient to keep the allied peoples adequately fed. Ration cards for the American consumer were rejected, and a lesser form of compulsion was devised in the "fifty-fifty" rule, which provided that millers and wholesale dealers must not sell wheat flour except when accompanied by the sale to the same customer of an equal quantity of substitutes, or unless they should have satisfactory evidence that the customer already had purchased the required amount of substitutes, and had not balanced such purchases by any purchases of wheat flour. Qualifying as substitutes were the following commodities: corn meal, corn flour, edible corn starch, hominy, corn grits, barley flour, potato flour, sweet potato flour, soybean flour, feterita flour and meals, rice, rice flour, oatmeal, rolled oats and buckwheat flour.

The "fifty-fifty" rule was under the fire of criticism from start to finish. However, it accomplished the purpose for which it was designed, and it is credited with wheat saving exceeding 30% of normal use and to have averted a wheat famine. One of the most common criticisms was that the rule discriminated against the housewife in requiring her to purchase flour on the basis of pound for pound, while allowing the baker to purchase and use substitutes on the basis of one pound of substitutes to three of flour. This naturally had a tendency to cause the discontinuance of bread baking in the homes, and an increased use of baker's bread. However, there were many substitutes on the consumers' list which were not commonly used in bread, and which the rule did not require should be mixed with wheat flour and used in bread.

● **The "80-20" Loaf.** — Fortunately 1918 brought a big wheat crop to America and all the other allied countries. Even without calling on the large reserves in Australia, it was seen that with the development of habits of economy in consumption both at home and abroad, there would probably be sufficient wheat supplies to tide us over another year. But we did not wish to risk the outcome of the war on the possibility of equally good crops for 1919. So it was decided that wheat conservation should continue through the year, in order if possible to provide a comfortable surplus of wheat to carry into the next crop year.

After a conference between Mr. Hoover and the representatives of the allied powers, it was decided to recommend a standard loaf of bread to be used throughout the entire allied world, consisting of not more than 80% wheat flour. It was believed that this would not only afford a palatable loaf which the housewife could bake successfully in her own home, but would result in providing sufficient wheat conservation to enable us to carry over approximately 150,000,000 bus of wheat into the next crop year. Accordingly a new wheat conservation regulation known as the "80-20" rule was promulgated on August 27, and was made effective on Sept. 1, 1918. The war was over before this device could be given much of a test. Wheat substitute regulations, in fact, were cancelled on the day following the Armistice, together with all rules contingent upon them. Soon afterward all other milling rules were set aside. Many millers and dealers found themselves with substitutes on their hands which had been purchased in excess of their normal requirements. Demand for these commodities immediately fell off, and in order to avoid waste the U. S. Grain Corporation arranged to relieve the owners by taking some of their surplus stocks, a considerable quantity of which was exported to Europe.

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You want to keep up, of course, on the co-ops. They're going into high right now in rebuttal of the National Tax Equality Association's argument that they should bear their fair share of taxation. An advertising campaign is spreading. Typical copy: "Tell your neighbors about this menace; write your congressman . . . to take a firm stand against any activities of this co-op enemy to change any legislation affecting farm co-operatives; don't wait . . . delay may indeed be fatal."

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. . . JOURNALISTIC TYCOONS.—Sometimes it seems to me a good many top flight men are lost to the higher ranks of journalism through their defection or deflection to the ranks of industrial management. Plenty of evidences are to be seen continuously in the pages of magazines and business journals. One such is the article by Harry A. Bullis, president of General Mills, Inc., in the April 14 Liberty. . . . Here is a clear and facile exposition of the WORLD FOOD SITUATION, at the end of which Mr. Bullis reaches the conclusion posed in the title, "We Can All Have Better Food and More of It." The condition merely is that we break down the silly international trade barriers and move over from the ideology of planned scarcity to deliberate and greatly increased food abundance. . . . BUT MR. BULLIS does not rest the case here. He has world welfare ideals as good as the best. "What is here advocated," he says, "is an orderly program for world development, in which better nutrition for the peoples of the world is only one phase. . . . In these days the world can move toward the goal of more food, better food and cheaper food as part of enhanced welfare. Welfare has many components—nutrition, housing, clothing, sanitation, education, transportation and communication—all more or less interdependent within countries and between countries." To insure these things the world must be well and highly organized for peace.

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. . . The late William M. Read, pioneer London flour importer, whose recent death is chronicled elsewhere in this issue, was a great friend of J. C. Pillman, another pioneer of the London trade—both well known to the flour milling fraternity of the United States and Canada. Their custom was to lunch together at the London Tavern at the corner of Mark Lane and Fenchurch Street, destroyed by enemy action in 1941. Mr. Read was one of the last members of the London flour trade to relinquish a stately custom of other years—the wearing of a silk hat on 'Change. He is shown here in this snapshot, with Mr. Pillman, who doubtless had reverted from silk topper to bowler not many years before.

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FLOUR FOR BRITAIN.—For those who would taste the melancholy and vicarious profits of times past and gone, there is appended (apropos of the news and editorial comment accompanying announcement of the death in England of William M. Read, pioneer in the British flour importing trade) a table of flour exports from the United States to the United Kingdom, as reported by the United States Bureau of Foreign and Domestic Commerce and compiled for publication in The Northwestern Miller Almanack. The figures are in barrels of 196 lbs (000's omitted):

1892	9,604	1917	3,014
1893	10,362	1918	10,014
1894	9,987	1919	10,440
1895	8,825	1920	3,072
1896	8,211	1921	3,311
1897	8,257	1922	1,829
1898	9,132	1923	1,369
1899	10,233	1924	1,699
1900	10,257	1925	1,210
1901	10,855	1926	1,439
1902	9,060	1927	1,438
1903	9,835	1928	873
1904	8,674	1929	1,317
1905	2,456	1930	1,536
1906	5,367	1931	1,115
1907	5;356	1932	239
1908	5,764	1933	70
1909	4,026	1934	66
1910	3,161	1935	53
1911	2,791	1936	43
1912	2,735	1937	96
1913	2,428	1938	202
1914	2,810	1939	68
1915	4,156	1940	31
1916	3,145	1941	..

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A New York Times survey of war veterans now back in college indicates, that journal reports, that there is no inclination among them to assume the attitude that the world owes them a living. Commenting upon this, the Chicago Journal of Commerce says: "They were growing up when the New Deal was 'making' work, and having seen leaf-raking programs in action, don't want any. If this division is typical of all the fighting men, as it may well be, the veterans will form a solid, reliant segment of the population, out of patience with paternalism and pressure blocks. The Wallaces and the Murrays might well take note."

THIS WEEK'S COVERS

Maybe this is one double handful of the huge consignment of United States wheat that is going abroad to feed peoples of the liberated countries. Could be. And beneath and behind it is many another generous handful. It would be very nice to think that it will come back to us in the form of generous and continuing good will.

The cover picture on the Milling Production Section of this issue shows Walter Arnold, King Midas Flour Mills, Hastings, Minn., engaged in making a break-release determination to insure proper roll-setting. The picture was made by Paul L. Dittemore of this journal's editorial staff.

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Gooch Milling & Elevator Co.
Lincoln, Nebraska

Chickasha Milling Co.
Capacity 800 bbls
CHICKASHA OKLA.
Cable Address "Washita"
Manufacturers of High-Grade Hard Wheat Flour
Foreign and Domestic Trade Solicited
Member Millers' National Federation

Lyon & Greenleaf Co., Inc.
MILLERS OF
High Grade Soft Winter Wheat Flour
Plain and Selfrising
LIGONIER, IND. NORFOLK, VA.

Mother Hubbard Flour
FOR QUALITY, FLAVOR AND ECONOMY
Hubbard Milling Co.

Two of the Nation's Finest Flours
"AMERICAN EAGLE"
"THE ADMIRAL"
The H. D. LEE FLOUR MILLS CO.
Salina, Kansas

I-H
QUALITY MILLED FLOURS
Ismert-Hincke Milling Co.
Kansas City, Mo.

KING MIDAS FLOUR
KING MIDAS FLOUR MILLS
Minneapolis, U. S. A.

OATMEAL MARKETS

Toronto-Montreal: Oatmeal mills are busy with export orders. All their capacity is fully engaged until the end of May and it is evident there will be plenty of additional business later. Ceiling prices prevail. Quotations: rolled oats $3.15 bag of 80 lbs, cotton, in mixed cars; oatmeal, in 98-lb jutes, $3.85 bag, f.o.b. Toronto or Montreal.

Winnipeg: Demand for rolled oats and oatmeal is slow, and supplies are moderate, but quite sufficient to take care of requirements. Quotations: rolled oats, in 80-lb sacks, $3.25 in the three prairie provinces; oatmeal, in 98-lb sacks, 20% over rolled oats.

Minneapolis: Bulk rolled oats were temporarily not quoted on April 9: 20-oz packages $2.65 case, 48-oz packages $2.89.

Western Canada Visible Grain Supply

Visible supply of grain in the western inspection division April 6, 1945, and receipts and shipments during the past week, in bushels (000's omitted):

	Wheat	Durum	Oats	Barley
Fort William and Port Arthur—				
Semi-public terminals	53,844	1,920	19,146	16,363
Private terminals	..	..	66	..
Totals	53,844	1,920	19,213	16,363
Vancouver-New Westminster	16,361	..	246	51
Int. public and semi-public elevators	13,964	..	168	241
Churchill	1,878	..	..	..
Prince Rupert	922	..	..	..
Victoria	926	..	..	..
Totals	87,894	1,920	19,626	16,655
Year ago	76,550	1,503	9,064	10,424
Receipts during week—				
Ft. Wm.-Pt. Ar.	1,381	12	1,239	292
All other public and semi-public terminals, western div.	621	..	64	13
Totals	2,002	12	1,303	305
Shipments during week—				
Ft. Wm.-Pt. Arthur—				
Lake	2,918	..	1,754	1,114
Rail	124	26	688	242
All other public and semi-public terminals, western div.	291	..	108	28
Totals	3,333	26	2,550	1,384
TOTAL RECEIPTS Aug. 1, 1944, to April 6, 1945				
Ft. Wm.-Pt. Ar.	193,650	5,049	65,684	52,674
All other public and semi-public terminals, western div.	14,201	..	1,849	1,464
TOTAL SHIPMENTS Aug. 1, 1944, to April 6, 1945				
Ft. Wm.-Pt. Ar.	166,088	4,719	62,155	41,477
All other public and semi-public terminals, western div.	8,919	..	1,613	1,508

United States Visible Grain Supply

Visible supply of grain in the United States as compiled by the secretary of the Chicago Board of Trade, in bushels (000's omitted), of date March 31:

	Wheat	Corn	Oats	Rye	B'ley
Baltimore	741	341	8	55	4
Boston	3,153	31	1,318	..	..
Buffalo	255	59	33	413	425
Afloat	2,222	5,721	979	..	..
Chicago	..	1,229	..	7,906	1,245
Afloat	11,069	1,915	3,826	..	..
Duluth	8,116	236	224	334	6,314
Ft. Worth	1,231	281	..	37	91
Galveston	7,773	..	..	..	..
Hutchinson	684	1,094	48	..	..
Ind'apolis	20,725	2,256	43	19	..
Kan. City	337	218	3	296	911
Milwaukee	11,369	1,000	880	..	3,298
Mpls.	330	167	25	998	5,491
New Or.	119	4	5	..	..
New York	6,348	1,952	114	..	..
Omaha	5	337	..	19	596
Peoria	637	167	20	..	24
Philad.	290	261	9	..	..
Sioux City	1,946	1,149	209	6	8
St. Joseph	1,688	1,047	170	15	61
St. Louis	4,376	11	7	19	140
Wichita	..	220	..	..	160
Total Mar. 31, '45	83,414	19,696	7,921	10,117	18,768
Total Apr. 1, '44	109,726	12,992	4,084	20,804	8,431

Bonded Grain in the United States

Bonded grain in the United States March 31, 1945, in bushels (000's omitted):

	Wheat	Corn	Oats	Rye	Barley
Baltimore	1,303	..	..	..	..
Boston	238	..	..	..	..
Buffalo	5,607	..	..	46	..
Afloat	1,664	..	..	..	176
Chicago	96	..	23	..	..
Afloat	344	..	..	..	..
Duluth	22	..	219	..	168
Fort Worth	212	..	..	..	..
Lakes	..	..	..	..	569
N. Orleans	..	784	..	..	..
New York	1,105	..	..	..	..
Afloat	451	..	..	..	..
Philadelphia	428	..	..	..	..
Totals	11,470	784	242	46	913
March 24, 1945	12,331	892	569	46	392
April 1, 1944	4,640	..	..	1,992	13

SUNNY KANSAS

Wartime milling conditions, and wartime baking pressure never affect the pleasant, bakeable disposition of SUNNY KANSAS.

Here is a flour that runs true to form, good times and bad. Its disposition never changes.

The Wichita Flour Mills Co.
5,000 Sacks Capacity 1,000,000 Bushels Storage
WICHITA : : : KANSAS

Coast To Coast Grain Service
CARGILL
INCORPORATED
Minneapolis and All Principal Grain Markets

WHEAT
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TRUCK-LOAD
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Any Where
Any Time

Exceptional Bakery Flours
TWELVE-40 NO-RISK PLA-SAFE
THE ABILENE FLOUR MILLS CO.
ABILENE, KANSAS
Capacity 3,000 Cwts. Daily *Grain Storage 1,000,000 Bus.*

Since 1882
FLOUR
BIG
BOOST

Thirteen Major Changes Made in Revised Sweet Goods Ceiling Order; Pricing Same

Washington, D. C.—Thirteen major specific changes were made in a new revision of MPR 319, which establishes maximum prices for pastries, doughnuts, sweet-yeast raised goods, pies, fruit cakes and all other cakes except cookies, and which became effective March 30. The basic methods of computing prices under the revised order remain the same.

Changes in the order represent clarification and refinement of procedure to make instructions more explicit, according to the Office of Price Administration. Changed procedures are:

Three Classes

1.—Bakers have been classified into categories representing the type of sales made during the base period: (a) producers who sold at least 25% of their total net sales to retailers; (b) producers who sold to ultimate consumers and who made less than 25% of their total net sales to retailers; and (c) producers selling to wholesalers and route sellers and who made less than 25% of the total net sales to retailers. Methods of calculation of basic prices are set up for each group.

2.—Discounts allowed to wholesalers and route sellers by producers have been increased from 25% to 36%. This change was made at recommendation of industry advisory committee as it was found that former discount was too small to reflect normal merchandising charges.

Filing Requirements

3.—Producers still must calculate their maximum prices in April and October each year. However, they now must report these to OPA only if the recalculated prices are lower or higher than the previous ones. If the recalculated price is lower, the producer must use it as his maximum for the following six-month period, but if it is higher he may use the higher maximum or the old ones, just as he chooses. Retail bakers (who sell at least 75% of their output to ultimate consumers) must report their prices to their district OPA office. Producers who sold to any other class of purchaser during the base period are required to report their maximum prices to the OPA at Washington.

4.—Producers who did not make sales during the base period must use their first month's total net sales as the basis in reporting to OPA.

5.—A subsection has been added to Section 10 which sets forth a method for producers to recalculate maximum prices where they have been unable to determine direct labor costs and mark-up separately during the base period or where they did not produce the item during the base period. In the first instance they may obtain the necessary figure by subtracting average ingredient and packaging costs from the price charged for the product during the base period. In the second instance, producers can obtain the figure by subtracting their ingredient and packaging costs from the maximum price first established for sale of such product.

6.—Producers may continue to reflect changed costs in maximum prices by adjusting weight rather than price. In addition they may also increase the weight of a product and increase maximum prices by an amount in the same ratio to the factors used in establishing the original maximum price for the lighter product.

7.—In determining maximum prices for new products, producers are no longer permitted to take the maximum price of a similar product produced by their most closely competitive seller of the same class. Henceforth, producers will determine maximum price for a new product by pricing on a basis of their own closest similar commodity or they may take cost of ingredients and packaging materials of the new product and add thereto direct labor costs and mark-up on a product produced by them having a greater weight but the same form, basic dough or batter, and icing, filling or topping characteristics, adjusted downward in accordance with the ratio of the weight of the new product to the weight of the old product. Where unable to obtain a maximum price by this method, a producer may apply to the OPA regional office for the establishment of a new price.

8.—Wholesalers and route sellers who purchase fruit cake on a f.o.b. basis may add actual transportation costs incurred, provided their producers' maximum price reflected a mark-up determined on that basis.

9.—Wholesalers and route sellers nection with bakery products sold to them unwrapped.

10.—Certain exemptions have been made concerning the requirement that the ultimate consumer maximum prices be marked on consumer packages. The exemption applies to sales to restaurants, f.o.b., fruit cake cakes and sales to ultimate consumers if a ceiling price list is furnished them.

11.—Every seller of bakery products at retail, except route sellers, are required to post maximum prices at or near the place in the store where products are offered for sale.

12.—Methods of determining mark-ups are outlined in Sec. 12. These generally are the same as before.

13.—Producers must keep copies of reports filed under the recalculation and maximum price reporting procedure. For products manufactured during the base period, copies must be kept of all calculations made in filing such reports including invoices showing ingredient costs, packaging material, cost of delivery on delivered sales, payroll records of March, 1942, direct labor costs of April, 1943, and mark-up and selling price during the base period for each product produced. Other record keeping requirements on new products not manufactured during the base period are also required.

——BREAD IS THE STAFF OF LIFE——

Grain Products Head WFA Deliveries During February

Washington, D. C.—War Food Administration deliveries of food and other agricultural products for government supply programs, both domestic and overseas, totaled 933,491,352 lbs in February, according to a report by the Department of Agriculture. This represents an increase of 152,615,409 lbs over January deliveries, and 67,606,496 lbs more than February, 1944. Total deliveries thus far for 1945 are 1,714,367,295 lbs.

Grain products headed February lend-lease deliveries, with 246,672,858 lbs, or 33% of the lend-lease deliveries, compared with 157,601,186 lbs in January. Included in the February total were 68,656,650 lbs of white flour.

Meats were second, with deliveries reaching 210,261,550 lbs during the month, compared with 184,539,241 the previous month. Other commodities, with comparisons for January, include: fruits and vegetables, 85,297,758 lbs compared with 65,243,350; fats and oils, 32,025,503 lbs compared with

BACK TO SCHOOL—The picture above was taken during a session of the wheat variety identification school held recently at Kansas State College, Manhattan, and shows some of the 50 students who were enrolled. Seated at the table in front, from left to right, are W. B. Madaus, William Kelly Milling Co., Hutchinson; William W. Sudduth, Larabee Flour Mills Co., Kansas City; H. G. Stevenson, Kansas Flour Mills Co., Kansas City, and Mrs. Faye McAllaster, Arnold Milling Co., Sterling. Seated at the tables in the rear, from left to right, are: R. E. Larson, General Mills, Inc., Kansas City; Herbert H. Regier, Buhler Mill & Elevator Co., Buhler, Kansas; R. N. McCaull, Pillsbury Mills, Inc., Minneapolis, Minn; J. O. Kocher, General Mills, Inc., Wichita; E. V. Hetherington, General Mills, Inc., Minneapolis; V. I. Cummins, Consolidated Flour Mills Co., Wichita; I. B. Carr, Pillsbury Mills, Inc., Wichita; C. C. Kelly, president, William Kelly Milling Co., Hutchinson, and (at table, right front) Charles Light, Light Grain and Milling Co., Liberal, Kansas. Standing at the rear of the room are Prof. L. P. Reitz, Kansas State College, and Lt. F. T. Dines, U. S. Navy, who conducted the short course.

39,577,906, and dairy and poultry products, 67,040,400 lbs compared with 65,103,955.

Approximately 79% of the total deliveries, or 736,035,539 lbs was delivered for shipment to allied nations under the lend-lease program. A large share of the lend-lease commodities went to the United Kingdom and other British possessions, who received 393,509,576 lbs, or 53% of lend-lease deliveries. During January, Great Britain received 273,906,280 lbs and, in February, 1944, about 281,397,299 lbs.

Russia, the next largest recipient, received 242,900,546 lbs, or 33% of lend-lease, compared with 196,604,794 lbs in January and 269,422,945 lbs a year ago. Approximately 14% of lend-lease, or 99,625,417 lbs, was delivered for shipment to Greece, metropolitan France, French West Africa, French Colonies Supply Mission, North Africa, the Netherlands and dominions and colonies.

Cash sales of food and other agricultural commodities to the U. S. armed forces, the Red Cross, foreign relief and other agencies that share in the U. S. food supply totaled 125,355,819 lbs, or 13% of total deliveries for the month. Sales to the armed forces represent only a small percentage of their total food purchases.

Delivered under the Caribbean stockpile program were 46,042,207 lbs of food, or approximately 4% of the total. Approximately 23,449,883 lbs were delivered on the Hawaiian program, 1,270,704 lbs to school lunch programs, domestic relief and other civilian programs, and 1,337,200 lbs to the United Nations Relief and Rehabilitation Administration, all of which was allocated to Italy during February.

—BREAD IS THE STAFF OF LIFE—

LOWER APRIL FEED GRAIN PRICES SEEN BY EXPERT

Manhattan, Kansas.—Small declines in prices of feed grains appear probable in April, in the opinion of George Montgomery, grain market analyst of the Kansas Experiment Station, College of Agriculture.

Shortage of cars has retarded the movement of corn and other grains to terminal markets. Large quantities of high moisture corn and grain sorghums still remaining on farms in some areas will exert a downward pressure on local prices as warm weather approaches if cars are not available for movement of this grain. If cars should become available for relatively free movement, increased receipts probably would depress terminal prices for lower grades of feed grains, it is stated.

Decreased numbers of hogs and poultry and restricted full feeding of cattle have decreased feeding demand compared to the two previous seasons. Withdrawal of sales of feed wheat is expected to have little influence on feed grain prices at country points because most areas are adequately supplied with locally produced grains. With the approach of warm weather and the pasture season, farm use of feed grains will decrease seasonally, he adds.

—BREAD IS THE STAFF OF LIFE—

CCC CORN LOANS

Washington, D. C—The Commodity Credit Corp. through March 24, 1945, had completed 13,371 loans on 13,379,977 bus of 1944 corn in the amount of $11,962,207.42. The average amount advanced was 89.4c bu. On the same date last year 6,140 loans had been completed on 6,901,942 bus.

Loans by states follow:

States in which loans originated	Farm-stored (bus)	Amount advanced
Illinois	400,160	$ 378,393.17
Indiana	46,147	45,117.73
Iowa	4,330,941	3,879,754.43
Kansas	263,764	238,342.60
Kentucky	55,004	57,204.16
Maryland	536	594.96
Minnesota	506,760	456,353.65
Missouri	278,273	256,950.30
Nebraska	5,520,674	4,905,088.33
North Dakota	118,198	107,689.43
Ohio	8,482	8,602.00
South Dakota	1,850,608	1,627,721.07
Wisconsin	430	395.60
Total	13,379,977	$11,962,207.42

Combined farm and warehouse loans outstanding on other 1944 loan programs:

	Quantity (bus)	Amount
Barley	2,241,069	$1,835,830.82
Flaxseed	55,616	151,946.56
Grain sorghums	7,934,783	7,451,321.26
Rye	44,470	33,359.13
Soybeans	72,225	150,434.79
Hay and pasture seed	(lbs) 32,137,724	2,044,376.42

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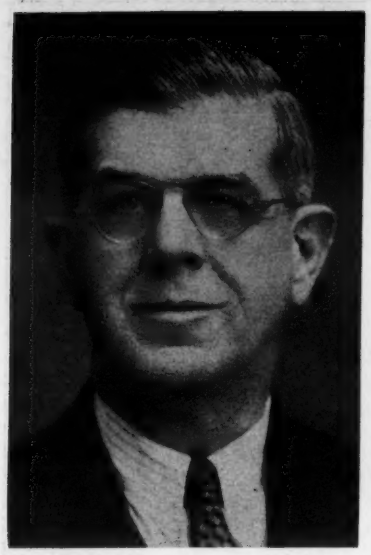
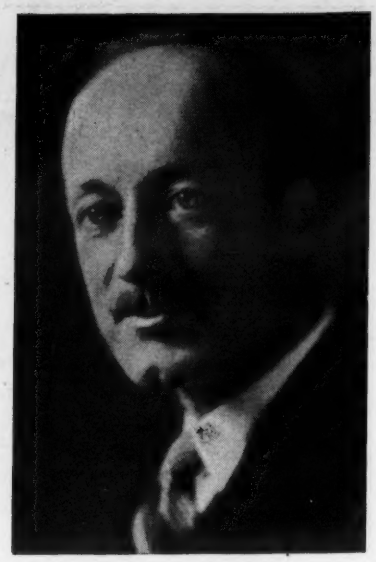


C. J. Patterson



Washington Platt

NEW GOVERNOR—C. J. Patterson of Kansas City, who recently purchased the Mueller Baking Co., Springfield, Mo., was elected a governor-at-large of the American Bakers Association at the meeting of the board of governors of the organization a few weeks ago.

DECORATED — Col. Washington Platt, widely known in the baking industry through his long association with the Borden Co., New York, recently has been decorated with the French Legion of Honor and the Croix de Guerre with Palm. Col. Platt is assistant chief of staff G-2 (intelligence) of a corps that has been in continuous combat on the western front for nine months. He is now in Germany.

Mostly Personal

Vernon C. Usher, of Usher's Associated Dairies, Chicago, and president of the Bakers Club of Chicago, has returned to his home from the Presbyterian Hospital, where he was confined for the past six weeks. Mr. Usher has been making good progress from a heart attack, but will need a complete rest and quiet for a few months before resuming his normal activities.

●

Herman Steen, vice president of the Millers National Federation, Chicago, is spending a vacation at French Lick Springs, Ind.

●

James R. Stewart, veteran Minneapolis grain man, and head of the former Banner Grain Co., has been in the hospital for the past week as the result of a hemorrhage. He is making a satisfactory recovery and his condition is encouraging.

●

John H. Blake, New York flour broker, and **William Schubert,** formerly of the Bogart Flour Co., recently spent a few days in Atlantic City, accompanied by Mrs. Blake and Mrs. Schubert.

●

Louis S. Myers, general manager of Rodney Milling Co., Kansas City, and Mrs. Myers will have open house on Wednesday evening, April 18, in their home at 5701 Oakwood Road, starting at 8 o'clock, in honor of their 25th wedding anniversary. No cards have been issued.

●

E. M. Stults and his son, **T. M. Stults,** have purchased a winter home at Boca Grande, Fla. The dwelling was built for Mary Roberts Rinehart, nationally known authoress, and is located on 11 acres. Mr. Stults was manager of the Buckeye Cereal Mills, Massillon, Ohio, until fire destroyed the plant a few years ago. Subsequently, he established the Buckeye Feed Mills at Dalton, Ohio.

●

J. L. Yergler, Oklahoma City, vice president and general manager of the Acme Flour Mills Co., made a recent trip to north Texas cities.

●

Al Cardenas, export manager, and **Diego Cabrera,** Havana representative, Valier & Spies Milling Company, spent a few days in St. Louis last week.

●

Officials of the Buhler (Kansas) Mill & Elevator Co. have the responsibility of keeping affairs orderly in their central Kansas town for the next biennium. **C. N. Hiebert,** general manager of the mill, is the new mayor, succeeding the late **J. C. Regier,** who served long and faithfully in that post. In addition, **H. M. Regier,** sales manager, was elected police judge at the election last week.

●

L. A. Laybourn, vice president of the B. A. Eckhart Milling Co., Chicago, spent a day with the grain trade in Hutchinson, Kansas, last week, and then visited the Kansas City market for a day.

●

John W. Hines, Chicago, well-known baker who is now retired, was married on March 17 to **Mrs. Helen Richardson Franklin.**

●

J. D. Williamson, president of the Duquesne Baking Co., Pittsburgh, is at home after undergoing a successful minor operation in a Pittsburgh hospital, and a several weeks' rest.

●

Joseph C. Bittermann, who is celebrating his 40th anniversary as a salesman for Standard Brands, Inc., recently was honored by fellow workers of the company's Fleischmann Divison at a dinner in Buffalo. Mr. Bittermann started with the company's predecessor, the Fleischmann Co., April 6, 1905.

●

Visitors in Nashville last week were **E. J. Long,** sales manager, Waggoner-Gates Milling Co., of Independence, Mo., who was calling on local flour buyers; **H. C. Tilford** of the Dixie Grain Co., of Shelbyville, Tenn., and **Gillem Maxwell, Jr.,** of the Middle Tennessee Mills of Lebanon, Tenn.

●

C. T. Vandenover, vice president, Atkinson Milling Co., Minneapolis, is spending the week in Chicago.

●

Arthur Van Dugteren has announced his resignation as assistant sales manager of the Henkel Flour Mills division of the International Milling Co., Detroit.

●

Harris McGavock, southwestern representative for Victor Chemical Works, became ill Easter Sunday and has been confined to his home since that time. He is not expected to be able to return to his office for at least a month.

DEATHS

Jacob C. Yager, 82, died in Portland, Oregon, last week after an extended illness. Mr. Yager was one of the pioneer operative millers of the Pacific Coast. Born in Wisconsin, he moved to the Pacific Coast at an early age, and entered the milling business at the Phoenix Mills in Sacramento, Cal. Later he moved to the Pacific Northwest, where he served as manager of the H. P. Isaacs Milling Co. at Walla Walla. In January, 1901, he became milling superintendent of the Wasco Warehouse Milling Co. at The Dalles and served in that capacity until his retirement—over 25 years. He designed the present mill after its predecessor had been destroyed by fire. He was active in operative milling circles and at one time was president of the Association of Operative Millers.

William A. Van Horn, former director of the Cincinnati Grain & Hay Exchange, died recently in Cincinnati, at the age of 67. He moved to Cincinnati in 1912 from Lawrenceburg, Ind., and conducted a hay and grain business at 222 West Fourth Street. He later was associated with Henry Wolter & Co. until he retired in 1943. He had held memberships in the Chamber of Commerce and in the Board of Trade, successor to the Grain & Hay Exchange.

Joseph H. Ismert, 62, died at his home in Wellesley Hills, Mass., on April 4. He had spent many years in the flour milling business as a salesman. For the past 10 years he had represented the Topeka (Kansas) Flour Mills Co. in New England. Prior to that time he was associated with the Ismert-Hincke Milling Co., Kansas City. His brother, **Leo M. Ismert,** is flour buyer for the Quality Bakers of America, New York.

William E. Lake, 59, brother of **Fred W. Lake,** president of the Colorado Milling & Elevator Co., Denver, died at St. Mary's Hospital in Kansas City April 6. Mr. Lake was associated with Herrick Waddell & Co., Kansas City. He was born in Clinton, Mo., and had lived in Kansas City since 1900. Surviving are Mrs. Lake, a sister, Mrs. A. C. Price, Fillmore, Cal., and his brother.

Mrs. William B. Lathrop, wife of the Kansas City regional director of the Commodity Credit Corp., died April 4 after a long illness. Although she had not been in good health for some time, Mrs. Lathrop was in the hospital only a few days prior to her death. She is survived by a sister and three brothers, one of whom is Cliff Langsdale, a leading Kansas City attorney.

Joseph Pilawski, 71, proprietor of the first Polish bakery in Manchester, N. H., and one of the city's most prominent Polish-American residents, died recently at his home. Survivors are the widow, two daughters and five sons, including Lt. John Pilawski, Camp Meade, Md., and Seaman 1/c Frank Pilawski, in the Pacific war area.

Charles W. Buckley, 87, the oldest member of the Chicago Board of Trade, died April 5 at Chicago. A founder of Buckley & Co., commission firm, he had been a member of the exchange since 1885.

Simon P. Barshinger, Red Lion Milling Co., York County, Pa., a long time member of the Pennsylvania Millers and Feed Dealers Association, died recently at the age of 81.

A. A. Roudabush of the Shenandoah (Va.) Flour Mills, recently died at his home after an illness of several months.

Boxcars

(Continued from page 9.)

that about 12,500 Canadian boxcars are in the United States, and that the Association of American Railroads has ordered eastern and southern lines to return Canadian cars to the Dominion empty.

Authorities in western Canada have expressed fears that any holdups in deliveries would likely cause a serious congestion when transportation facilities later become fully taxed to meet the requirements of the intensified war in the Far East.

——BREAD IS THE STAFF OF LIFE——

TO BUILD MORE BOXCARS

Washington, D. C.—A direct transfer of carbon steel from the army to the Office of Defense Transportation will enable the ODT to secure the production of additional new railroad boxcars in the first nine months of 1945. The Army has turned over 34,000 tons of carbon steel for the second quarter of 1945, which will be used for an additional 2,000 boxcars, the ODT said, bringing the total boxcar production for the first nine months of 1945 to the desired goal of 20,000.

Col. J. Monroe Johnson, ODT director, said that railroads have placed orders for all these new boxcars. The cars will be in service by October, in time for the heavy grain movement due at that time, and will also place the railroads in a better position to handle the increased freight traffic to the west coast called for by the huge shipments of war materials to the Pacific theater of operation.

The action of the Army, Col. Johnson said, indicates a recognition on the part of the Army of the importance of the ODT boxcar program as an essential feature of our war effort.

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WITH THE ARMED SERVICES

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Lt. Charles A. Parsons, son of **A. Parsons,** vice president in charge of grocery products sales, Pillsbury Mills, Inc., has been flown back from England for further treatment of an eye wound received in France last November. He is now at the Valley Forge General Hospital near Philadelphia.

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Capt. K. K. Smith, Jr., son of the assistant to the president of Kimball Milling Co., Fort Worth, Texas, is by strange coincidence attached to Company A, 358th Infantry, 90th Division, the same unit his father had when he was a captain in the last war. The captain was a member of the coast guard until transferred recently to the infantry.

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Lt. Col. James H. Myers, formerly with the central bulk products division offices of Pillsbury Mills, Inc., has recovered from wounds received in France several months ago. He is now back on duty with an armored division attached to the Seventh Army. During his hospitalization he was awarded the Purple Heart.

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W. F. Cronk, Jr., who was with the Minneapolis grocery products department of Pillsbury Mills, Inc., before entering the service, has been promoted to lieutenant commander. Lt. Com. Cronk, who has seen duty in the Pacific theater, is now stationed at Norfolk, Va., where he is assistant to the admiral in charge of the navy base.

Johnson

(Continued from page 9.)

appreciate that you are presumptuous to make such recommendations. I consider you so.

I do not ask whether you know that there is a war on, but I do ask whether you realize that there are two wars now as compared to one heretofore, either of which would challenge the ingenuity and genius of the transportation people of America. In addition, there are the rescued peoples, all over the earth, hungry and cold and pleading for relief. That transportation alone is challenging.

The exports of America in 1944 were 465,238 cars or 33.2% more than in 1943 and, due to the outbreak in the full tide of the Pacific war, exports of course have been at a greater rate of increase in the latter part of 1944 than in the early part, and they now are at an unbelievably greater rate.

This has been maintained in spite of the fact that the principal gateways of the United States experienced a convulsion of nature in snow and blizzards for months unprecedented in the meteorological history of the nation. (You might recollect your Kansas City flood situation in 1903, which was pigmy by comparison, both in extent and in effect on the nation.) Transportation has no supports or reserves with which to contend with such an upheaval, but, even so, it has flattened out the "break through." The entire recovery, however, because of delay of the program will take more than a year. I want to remind you that during the period those gateways were paralyzed by weather, except for a few embargoes, the shipping public, including you, shipped into that area without regard and wondered why they didn't get their cars back.

During that time and for some time thereafter there was a tremendous over-ownership of cars in the East and, in addition, an unusual number of Canadian cars and, of course, an under-ownership of cars in the West. However, at the same time there was a far more critical car shortage in the East than in the West. This was due entirely to manpower shortage, and transportation was then confronted by another draft of its labor which has since been averted.

We found ourselves at that time facing, and to some extent we still face, the fact that we have boats with grain in storage on the Great Lakes that must be unloaded else they will be late (navigation is now open and they are late) for the transportation of grain, ore and coal on the Great Lakes.

With elevators in the West filled with wet corn now damaging, with the gigantic burden of moving grain to the rescued countries, and with a backlog of wheat to be moved to make room for the new crop, which promises to be another billion bushels, the grain movement is a problem within itself.

Even with all that, more was shipped to our armed forces than ever before. We are moving more grain today than we were a year ago, as is shown by the enclosed report of the Interstate Commerce Commission. The last report on grain carloadings, herewith enclosed, shows loadings above 1943 or 1944. At the rate of present loadings we will have moved by the last week of June at least 48,000 carloads more than in the same period last year.

Of course, if we had more boxcars and more employees and more locomotives, we would be loading and handling more. We are faced now with the biggest boxcar shortage in many, many years. A chart is enclosed showing the comparative shortage now and formerly.

The carloadings today are almost, if not quite, on a parity with full fall loadings. And yet you complain.

Of course, when we were faced with these problems, our first effort after the military (please never forget that) was to unload boats to avoid delay of vessels on the lakes, next to save as much of the wet corn as possible, and then, so far as grain is concerned, to move the backlog of wheat. We are loading at present a greater proportion of corn as compared to wheat than ever before, and that is as it should be.

You should always remember, when you are prone to criticize, that in World War I we had about 1,900,000 railroad employees and that now we have only 1,410,000, of which 300,000 (including 115,000 women) are recruits to replace that number of men drafted to the military. We have 22,500 fewer locomotives, 600,000 fewer freight cars, and 17,000 fewer passenger cars, and yet we are transporting over twice as many passenger miles, nearly twice as many revenue ton-miles as in the first World War, and one and one half times as many revenue ton-miles as in 1941. I enclose tabulation for your perusal.

I also enclose tabulation showing that we have attempted to get for the railroads: 186,000 more freight cars, 2,000 more locomotives, 2,600 more passenger cars, and 762,000 more tons of rail than we have received. I do not here attempt to give you the details of how many buses, trucks and cars we have tried to get without success.

Remember, too, that in the first World War the average haul was about 250 miles, and now it is about 500 miles, and will grow tremendously greater as our emphasis is transferred from the Atlantic to the Pacific.

The outlook for the next 15 months is most alarming. You will probably store more grain in the producing areas this year than ever before. I am informed that the Department of Agriculture is making provisions and arrangements therefor. There will be throughout our commercial activities difficulties in transportation. We hope that such difficulties may be averted for the military.

Immediately on receipt of this letter from the Board of Trade of Kansas City, the Office of Defense Transportation and the Interstate Commerce Commission called in the Association of American Railroads to discuss the various statements made in your letter and your recommendations. The Association of American Railroads was asked to write up the conclusions there reached, using reports and data of the Interstate Commerce Commission and the Association of American Railroads. That was done, has been verified, and the statement is herewith enclosed. It would seem your letter needs no further comment, except your proposal "that immediate consideration be given to the appointment by you (me) of a committee of railway operating officials not to exceed three in number to be advantageously located within the eastern congested area, whose responsibility would be to work with the railways in an effort to break up the seriously congested situation . . . and that such committee be given absolute authority to support its judgment in whatever way may be necessary to obtain the result so badly needed." I presume that this was copied by you from a recommendation made to me by the ODT-ICC Grain and Grain Products Transportation Conservation Committee in Chicago during the congestion which was almost as absurd then **during** the congestion as it is now **after** the congestion. Did you ever pause to think that I have at my command the talent and experience of every railroad man in the United States and that they were all giving their expert advice, work, and collaboration to the breaking up of the congestion, together with many hundreds of soldiers and thousands of civilians? It was successfully done, and much earlier than anybody, including the Grain Committee and, I presume, you, would have thought possible, with the result that empty cars moving west at the rate of only 604 on March 1 reached 1,039 by the 8th and nearly 1,500 by the 13th. On the 16th empty boxcars moved west at the rate of 1,654. During the first 29 days of March, there moved to the West 33,546 empty boxcars, an average of 1,157 cars per day, much of this movement during the congestion, and many other thousands of loaded cars that were made empty in the West. Chart is herewith enclosed.

I hope sincerely that you will study the enclosures in order that you may grasp the full meaning and import of each.

I have found the Board of Trade of Kansas City helpful in the past, although last year on your insistence my agents were persuaded to allow congestion to develop in Kansas City which had to be straightened out ruthlessly. The transportation problems in front of us will require hearty, cordial co-operation and that each of us lose sight of our own selfish interests for the common good. There is no other way to solve this transportation problem. That method in the past has made the accomplishments of transportation possible, and I place those accomplishments not second to those of the army or the navy. I sincerely hope that you are in a position in the difficulties ahead to render that customary hearty support and co-operation.

Very cordially yours,

(Signed) J. M. Johnson,

Director, Office of Defense Transportation.

Anniversary

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Thomas L. Brown Celebrates 50 Years in the Milling Business

Thomas L. Brown

His fiftieth anniversary in the milling business was observed by Thomas L. Brown, manager of the durum department of the Commander-Larabee Milling Co., Minneapolis, on April 9. Office associates took advantage of the opportunity to stage a party at the close of business that day, and presented him with a suitable souvenir of the occasion.

Mr. Brown, a native Minneapolitan, started to work for the Washburn-Crosby Co. in 1895 after finishing school. He worked in various departments, and in 1899 was transferred to Cincinnati to learn selling, later becoming manager of that branch. He returned to Minneapolis in 1902, and for a few years thereafter was in charge of sales in Indiana and other central states territory.

He has been associated with the Commander interests for about 20 years, and has a wide acquaintanceship with the macaroni trade from coast to coast.

MARKETS IN DETAIL

U. S. FLOUR MARKETS

THE SOUTHWEST

Kansas City: Already booked for most of the flour they can grind between now and July 1, flour millers of the Southwest did not press for sales last week. However, they booked 65% of capacity, compared with 76% the previous week and 44% a year ago. Much of the volume was sold to the army, with bakery business just about as good as millers wish to have it. One or two big buyers again were in the market, but the volume taken was not large. Awaiting Senate subsidy action, millers and buyers are assuming that a rush of business will occur after this announcement is made. Millers will be attempting to sell ahead at the present price structure and will have the hazard of transportation and labor shortage as supporting factors. Buyers also will have these things in mind and probably will be ready to book in order to make sure of their supplies for the latter part of the year. A negative factor in the sales picture is the likelihood of a quick ending of the war in Europe. If that should occur, sales would probably drag, regardless of subsidy action. Clears are somewhat firmer. Offerings are light and buyers are not easy to find.

Two mills report domestic business active, 9 fair, 4 quiet, 3 slow and 8 dull.

Quotations April 7: established brands family flour $4.15@4.35, bakers short patent $3.41, standard patent $3.41, straight grade $3.31, first clears (high protein) nominal $2.85@2.95, other clears $2.20@2.35, soft wheat straight grade $3.35.

Oklahoma City: A slight decline in flour sales occurred last week, averaging 38% of capacity, compared with 55% the previous week, and with 21% a year ago. Family buyers took 62% of bookings and bakers 38%. Operations averaged 75%, compared with 68% a year ago. There was no change in prices. Quotations, sacks, delivered Oklahoma rate points April 7: hard wheat short patent flour $4@4.50; soft wheat short patent $4@4.50, standard patent $3.60@4, bakers short patent $3.67, bakers standard $3.62.

Omaha: Mills sold 35 to 175% of capacity last week to all classes of buyers, including the army. Shipping directions on former sales are good. Flour prices are unchanged from last week. The car shortage situation is virtually unchanged.

Wichita: The car shortage was somewhat improved last week, millers reported, although one mill had fewer cars than formerly. Mills were operating from 85 to 100%. All mills are well behind in directions because of the accumulated deficiency in deliveries. Sales varied from 30 to 100%.

Hutchinson: Flour sales showed but little improvement last week. Only mild interest was shown and most bookings were small and to bakers. Shipping directions slowed somewhat and a slight easing of boxcars permitted mills to catch up with back orders.

Salina: The demand for flour remains at low ebb with few bookings. Shipping directions are good, but boxcars are scarce.

Texas: Flour business the last week was again limited almost entirely to sales of family flour for prompt shipment, which amounted to about 25% of capacity. Practically no sales of bakers flour were made. Sales to government agencies also were light, as mills generally feel that they already have all the bookings they can take care of readily. There is a better supply of boxcars at terminals, enabling shippers to make progress in filling wheat sales to mills, but country shippers still are getting only occasional cars for wheat. Quotations April 7: family flour $3.90@4.15, high patent $3.65@3.90, standard bakers, ceiling $3.52, first clears enriched $3@3.15, delivered TCP.

THE NORTHWEST

Minneapolis: First-of-the-month flour buying, which reached considerable proportions earlier in the crop year, has tapered off until now it is relatively unimportant. This is possibly due to the fact that mills are holding for ceilings, and less willing to name bargain prices. And the trade, of course, has its needs for April-May-June fairly well covered. Since they are protected by the ceiling, there is no incentive for buyers to add to their bookings, and run the risk of having carrying charges to pay.

Every one is waiting to see if the subsidy will be continued, by act of Congress, after June 30. An announcement of its continuation is expected and, if it comes, it will relieve the tension considerably. There would be no necessity then for mills to grind out and get into transit all the business on their books before June 30, and it would enable the mills to give the army more flour than it is now getting. As it is, however, it is estimated that the government is getting at least 15% of the current flour production.

Shipping directions are coming in from the regular trade, and are piling up faster than the mills can ship. The car shortage is still causing a lot of concern to country and city mills, both from the matter of getting needed wheat supplies and ability to get their products shipped.

The sales figures by spring wheat mills for the week ending April 7 are somewhat misleading, since they include the heavy lend-lease sales of March 31 which were not compiled at press time a week ago. The sales equalled 128% of mills' capacity, compared with the reported 23% a week earlier, and 47% last year.

Quotations April 9: established brands family flour, enriched $4.30@4.46, high gluten bakery flours $3.54, bakery short patent $3.44; first patent $3.44, standard patent $3.34; fancy clear $3.24@3.34, first clear $3@3.10, second clear $2.70@2.90, whole wheat $3.30@3.54.

Interior mills, including Duluth: Mills report another quiet week, with the trade waiting to see if the subsidy will be continued after June 30. Large bakers show a willingness to contract for 120-day shipment, but mills will not take the chance until Congress acts. Shipping directions are plentiful. An urgent local and shipping demand for millfeed continues at most stations.

THE CENTRAL WEST

Chicago: Flour business showed no signs of improvement last week. Buyers were not particularly interested, as most mills held prices close to or at the ceiling, and only moderate sized sales were made. Shipping directions were good. Family flour demand slowed up and deliveries also fell off. Quotations April 7: spring top patent $3.40@3.57, standard patent $3.30@3.47, first clear $3.10@3.39, second clear $2, family flour $4.51; hard winter short patent $3.47@3.57, 95% patent $3.32@3.47, first clear $2.68@2.92; soft winter short patent $3.45@4.31, standard patent $3.26@4.06, first clear $2.75@3.11.

St. Louis: A good demand for flour existed last week, but due to practically no change in the car situation, mills were unable to take care of it. However, some little new business was placed on the books to take care of immediate wants of the bakery trade. Clears were in good demand, while offerings were light. Prices were strong and higher. Jobbers report new business very light. However, shipping directions from the bakers are good. Mills are not selling for future delivery. There is no improvement in the shortening situation; in fact it is more difficult to get supplies. The sugar shortage was eased by the arrival of some contracts.

Central states mills report no change in the situation. The demand is good, but they are unable to fill requirements of the trade, due to the lack of rolling equipment. Prices are firm at the ceiling.

Quotations April 7: soft wheat patent $3.98, cake flour $4.58, straight $3.74, family short patent $4.29, straight and 95% $4.29, first clear $3.32@3.75; hard wheat bakers patent $3.44, family short patent $3.57@3.83, straight and 95% $3.44@3.49, first clear $2.85@3.38; spring wheat patent, straight and 95% $3.44.

Toledo: The car situation appears to be a little easier in spots, but not generally; in fact, some millers say that it is just as bad and tight as ever. Millers continue to be not so much concerned about selling flour as being able to get out some of the overdue shipments. They try to take care of regular customers to prevent complete exhaustion of supplies. It is easier to understand the indifference of millers toward making new sales than it is the apathy of buyers toward future supplies. The outlook for the new crop of wheat is exceptionally good, but that is not considered bearish in view of the prospective world demand, provided the wheat does not back up through inability to move it to points where needed.

Cleveland: The flour market with both jobbers and bakers has been quiet the past week. Scattered sales have been made only to buyers who are in immediate need. Mills are not inclined to contract ahead and most buyers feel the same way about future contracts. The car situation has not improved. Mills are several weeks behind in shipping. The labor situation is worse now than it has ever been. Now that the Passover holidays have been concluded, the jobbing business should return to normal again. Most mills are anxiously awaiting the government decision on the subsidy, and until this is settled the contracting of flour will be very quiet. Mills are having a great deal of difficulty in obtaining wheat. Prices are all at ceilings. Quotations April 7: spring first patent $3.80@3.90, standard patent $3.70@3.80, first clear $3.30@3.50; hard winter short patent $3.60@3.70, 95% patent $3.50@3.60, first clear $3.10@3.30; soft winter short patent $4.40@4.65, straight $3.60@3.80, first clear $3.10@3.40.

EASTERN STATES

Buffalo: Sales show some slight improvement, but the end of the war psychology tends to keep the trade on a rather conservative basis. On the constructive side of the ledger was assurance, apparently, that the Senate would pass the flour subsidy bill, which would make it possible for millers and their customers to plan more accurately. The mills are crowded with directions, but finding the transportation to move it is the biggest problem. Due to government buying of hard wheat types, clears were up from 5@10c a sack.

Quotations April 7, cottons: spring first patent $3.80, standard patent $3.70, first clear $3.40; hard winter short patent $3.80, 95% patent $3.70, first clear $3.30; soft winter short patent $3.75, first clear $3.10.

New York: With mills unwilling to sell beyond June 15, flour sales were held to a small volume. Fill-in orders are reported, but there is no sales or buying pressure. High glutens are offered practically on a quota basis and clears are also scarce in both the north and southwest. Eastern cake grades are slightly more available, but shortages of fat and sugar are limiting sweet goods production. Cars are coming through by rail at an accelerated rate, but yards here are congested, and word that Brooklyn eastern district terminal would issue no more permits for two more weeks is extremely discouraging. Trade is, therefore, more concerned with this phase of the market than in placing new orders. Buyers give consideration to the possible end of the war in Europe, rather than to current prospects. Quotations April 7: spring high glutens $3.95, standard patents $3.70@3.75, clears $3.50@3.60; southwestern short patents $3.80@3.85, standard patents $3.65@3.75, clears $3.15@3.30; soft winter straights, Pennsylvania $3.65@3.70, Pacific coast $3.70@3.77.

Boston: New flour business is light and mill offerings are small, since government orders continue to take up a good proportion of mill running time. Passage of the subsidy measure by the House does not tempt mills to take commitments for the customary 120-day period. While sellers concede that the risk is negligible, there are no reports of sales for shipment beyond the present June 15 deadline. It is probable that mill agents will maintain this attitude until extension of the subsidy is assured by presidential signature. Demand for flour is not active because, in general, the trade is well covered and seems intent on waiting for possible market recessions in the event that hostilities in Europe come to an abrupt close. Commitments the past week were entirely of minimum carlots for immediate requirements. Family flour sales were also light. Shipping directions have eased off. Mill quotations remain at ceilings or slightly below. Quotations April 7: spring high gluten $3.92@3.97, short patent $3.82@3.87, standard patent $3.72@3.77, first clear $3.42@3.48; southwestern short patent $3.82@3.87, standard patent $3.72@3.77; Texas short patent $3.82@3.87, standard patent $3.72@3.77; soft winter patent $3.75@3.90, straights $3.65@3.75, clears $3.55@3.65.

Philadelphia: Little flour was offered last week and prices were firmly maintained until at the close, when strength was less pronounced. Favorable war news tended toward a conservative feeling on the part of bakers, who were reluctant to increase their commitments at ceiling prices. The shortage of boxcars is becoming increasingly serious. Quotations April 7: spring wheat short patent $3.80@3.83, standard patent $3.70@3.73, first spring clear $3.50@3.55; hard winter short patent $3.80@3.83, 95% $3.70@3.73; soft winter straights nearby $3.35@3.45.

Pittsburgh: New flour buying is almost at a standstill. Family flour business is increased by seasonal demand. Bakers remain bearish and uninterested toward the market, still fearing an early end of the European war will bring a drop in prices. Mills hold quotations at ceilings or only slightly below. Directions are brisk. Clears also are firm and sparingly offered.

Bakers report a capacity demand for baked goods with materials on hand for baking extremely limited. Deliveries still are most unsatisfactory, owing to the car shortage and manpower inefficiency and shortage.

Quotations April 7: hard winter bakers short patent $3.80, straight $3.70, high gluten $3.90, first clear $3.22; spring bakers short patent $3.80, standard $3.70, high gluten straight $3.90, first clear $3.47; soft winter bakers cake flour $4.57, intermediate grade $3.90, straight $3.67, Pacific coast $3.70, family flour $4.10@4.71.

THE SOUTH

Nashville: Buyers who have waited for the change in the wheat subsidy were forced to replenish their stocks even though prices remained the same. Sales were on both soft and hard wheat flours, mainly short patents, and shipment is limited to 60 days. The rather unusual shortage of cut-off and clear flour is due to heavy buying by the War Food Administration and the army for April-May shipment, which allows no let-up in the boxcar situation. Mills are loading the few cars obtainable to capacity in order to keep their stock moving and the buyers satisfied. Flour prices are unchanged.

Quotations April 7: soft wheat cake flour $4.59; soft wheat cake flour not over .41% ash $3.92; soft wheat cake flour .41% or more ash $3.69; soft wheat short patent family flour $5@5.10; standard patent $4.85@5; straight $4.60@4.85; clear $4.15@4.45.

PACIFIC COAST

Seattle: Mills have been able to increase their output due to the arrival of another barge load of Canadian hard wheat from Vancouver, B. C., as well as the receipt of some Montana wheat. Flour continues in good demand, with mills trying to satisfy their old customers and at the same time keep up with government orders. Quotations April 7, basis carlots, f.o.b. Seattle or Tacoma: family patent, enriched, 50's $4.12; bakery pastry, 100's $2.98; bluestem, 100's $3.33; Montana hard wheat, 100's $3.59.

Portland: Offers of 33,000,000 lbs were tendered by mills of the Pacific Northwest, 6,000,000 lbs more than the government asked for, and it is understood the full amount was taken. Mills submitted varying offers, as some of them are booked pretty heavy and were not in a position to offer much for shipment by the middle of June. Some of these mills have heavy army and navy commitments which prevented offering in large quantities. However, the business was taken by a number of the larger mills.

Mills are running again at top speed, with ample supplies of Montana wheat moving in this direction.

Mills are spreading around their bakery flour to their regular customers and not caring to book too freely.

Quotations April 7: all Montana $3.60,

A SUMMARY OF FLOUR QUOTATIONS IN LEADING MARKETS

Week-end flour quotations, per sack (cwt), packed in 100 lbs. (Canadian quotations per bbl of 196 lbs.) All quotations on basis of carload lots, prompt delivery.

	Chicago	Minneapolis	Kansas City	St. Louis	Buffalo	New York	Baltimore	Philadelphia	Boston	Cleveland	†Nashville
Spring first patent	$3.40@ 3.57	$....@ 3.44	$....@....	$....@ 3.44	$....@ 3.80	††$....@ 3.95	$....@....	$3.80@ 3.83	$3.82@ 3.87	$3.80@ 3.90	$....@....
Spring standard patent	3.30@ 3.47	....@ 3.34	....@....	....@ 3.44	....@ 3.70	3.70@ 3.75	....@....	3.70@ 3.73	3.72@ 3.77	3.70@ 3.80	....@....
Spring first clear	3.10@ 3.39	3.00@ 3.10	....@....	....@....	....@ 3.40	3.50@ 3.60	....@....	3.50@ 3.55	3.42@ 3.48	3.30@ 3.50	....@....
Hard winter short patent	3.47@ 3.57	....@....	....@ 3.44	....@ 3.44	....@ 3.80	3.80@ 3.85	....@....	3.80@ 3.83	3.82@ 3.87	3.60@ 3.70	....@....
Hard winter 95% patent	3.32@ 3.47	....@....	....@ 3.31	3.44@ 3.49	....@ 3.70	3.65@ 3.75	....@....	3.70@ 3.73	3.72@ 3.77	3.50@ 3.60	....@....
Hard winter first clear	2.68@ 2.92	....@....	2.85@ 2.95	2.85@ 3.38	....@ 3.30	3.15@ 3.30	....@....	....@....	....@....	3.10@ 3.30	....@....
Soft winter short patent	3.45@ 4.31	....@....	....@....	....@ 3.98	....@ 3.75	....@....	....@....	....@....	3.75@ 3.90	4.40@ 4.65	....@ 4.59
Soft winter straight	3.26@ 4.06	....@....	....@ 3.35	....@ 3.74	....@....	3.65@ 3.70	*....@....	*3.35@ 3.45	3.65@ 3.75	3.60@ 3.80	4.60@ 4.85
Soft winter straight (Pac. est.)	....@....	....@....	....@....	....@....	....@....	3.70@ 3.77	....@....	....@....	....@....	....@....	....@....
Soft winter first clear	2.75@ 3.11	....@....	....@....	3.32@ 3.75	....@ 3.10	....@....	....@....	....@....	3.55@ 3.65	3.10@ 3.40	4.15@ 4.45
Rye flour, white	3.39@ 3.52	3.50@ 3.65	....@....	....@ 4.00	....@ 3.80	3.81@ 3.90	....@....	3.70@ 3.75	....@....	3.55@ 3.65	....@....
Rye flour, dark	2.65@ 3.09	3.08@ 3.23	....@....	....@ 3.48	....@ 3.30	....@....	....@....	....@....	....@....	2.90@ 3.00	....@....
Semolina, No. 1	....@ 3.75	....@ 3.62	....@....	....@ 3.99	....@ 3.98	....@ 4.03	....@....	....@ 4.03	....@....	....@....	....@....

	Seattle	S. Francisco	Standard patent—	Seattle	San Francisco		Toronto	**Winnipeg		Toronto	**Winnipeg
Family patent, 50's	$....@ 4.12	$....@....	Dakota	$....@....	$....@....	Spring top patents‡	$....@5.05	$....@ 5.30	Spring exports‡	$10.80	....
Soft winter straight	....@....	....@....	Montana, 100's	....@ 3.59	....@....	Spring second patent‡	....@4.40	....@ 4.80	Ontario 90% patents‡	5.50	....
Pastry, 100's	....@ 2.98	....@....				Spring first clear‡	....@3.30	....@....			

*Includes near-by straights. †Nashville prices basis f.o.b. Ohio River points for soft winter wheat flour. **In cottons, Fort William basis. ‡Secondhand cottons. ††98-lb cottons. ‡‡80-lb cottons. ††High glutens.

high gluten $3.60, bluestem bakers $3.37, bluestem topping $3.30, cake $3.80, pastry $3.08, pie $3.08, fancy hard wheat clears $3.30, whole wheat 100% $3.30, graham $3, cracked wheat $3.

CANADIAN MARKETS

Toronto-Montreal: Domestic sales of spring wheat flour are about normal. Mills are covering buyers' needs as these arise. Nothing new has developed in the exporting end of the business. Canadian mills have every bit of capacity booked up until the end of June and a great deal more would be taken if they could produce it, but sales have to be limited to capacity. Shipping conditions are steadily improving and now that navigation is open that will ease the situation further. Indications point to a very busy season in Canadian flour milling. Domestic prices are unchanged at ceiling levels and the export price is also fixed until present crown stocks of wheat are exhausted. Quotations April 7: top patents $5.05 bbl, seconds $4.40, bakers $4.30, in 98's cotton, mixed cars, track, Toronto-Montreal freights, add 10c extra where cartage is performed. For export, government regulation flour is quoted at $10.80 per 280 lbs, f.a.s. winter ports, May seaboard, and $10.75 June.

Winter wheat flour mills would be busy if they could get a sufficiency of wheat to grind. The grain is scarce and consequently sales of flour are small. Mill stocks are diminishing with little prospect of being replenished. Domestic flour demand is easily covered, but export business cannot be accepted. Prices stay at the ceiling. Quotations April 7: $5.50 bbl, in secondhand cottons, Montreal freights; for export $6.25 bbl, in cotton bags, Canadian seaboard, plus equalization fee of $1 bbl.

Deliveries of winter wheat continue light and are inadequate for demand. Farmers show no inclination to dispose of their stocks of this grain. Ceiling prices are paid for any wheat offering. Quotations April 7: $1.26 bu, Montreal freights, which is equivalent to $1.12@1.14 bu, f.o.b. shipping points, according to freights.

Winnipeg: Apart from minor lots sold to the West Indies and Newfoundland, there was a lull in the export demand for Canadian flour last week. Domestic trade continued on a good scale, and mills are operating to capacity, with orders booked up into June. Supplies are moving freely. Quotations April 7: top patent springs for delivery between Fort William and the British Columbia boundary, $5.30, cottons; second patents, $4.80; second patents to bakers $4.60.

Vancouver: Flour dealers in this territory still are confining the bulk of their efforts to domestic business, since there is no indication of any immediate export business in the offing. The lack of steamship space is the principal stumbling block to overseas business, although western Canadian mills are still glutted with war contracts and lend-lease business.

Hard wheat flour supplies on hand here are considered ample for current needs with the bulk of the sales made to the bakery trade and store business still on a comparatively low level. Prices are firm at ceiling levels. Quotations April 7: cash car basis for 98's cottons, $5.40 for first patents; $5 for bakers patents and $4.90 for vitamin B.

The supply and demand picture for soft wheat flour from Ontario mills is steady, price to the trade holding unchanged at $7.50.

MILLFEED MARKETS

Minneapolis: The eastern trade is particularly hard pressed for millfeed, and apparently is willing to pick it up wherever possible regardless of costs at destination. While observing ceilings, they will take on feed at points that ordinarily are not considered as supply points for New England territory, and price is a secondary consideration. Conditions in western territory, however, are different. Buyers here are able to supply their needs by truck, when empties are unavailable, and have managed to build up a little surplus. Demand is very keen, and mills are dividing what little they have to sell among favored customers, spreading it as far as possible. The prospect of early pasturage and lower prices on coarse feeding grains have not curtailed inquiry for millfeed as yet. Ceiling: $37.75.

Oklahoma City: Millfeed sales were brisk last week, with supplies limited. No change occurred in prices. Quotations, burlaps, carloads for southern deliveries: bran, mill run and shorts $1.95 cwt; for northern deliveries: $1.90.

Omaha: Demand continues firm with the supply small. Some forward booking is reported. Prices are unchanged at the ceiling.

Wichita: Although mills last week operated very close to 100% of capacity, hope of catching up with millfeed orders is very slim. Demand is increasing as farmers and feeders are demanding bran and shorts for pigs, calves and chicks. Quotations were reported for bran and shorts, basis Kansas City, at $36.50 ton.

Hutchinson: Millfeed interest was active and easing of the car situation last week permitted mills to make the first shipments in a fortnight, thereby easing the storage problem. Quotations continued at ceiling of $36.50@37.50 ton, Kansas City basis for bran, mill run and gray shorts.

Salina: Demand is exceptionally good with the trend steady and supplies considerably below trade requirements. Bran and shorts continue to sell at ceiling levels.

Fort Worth: The situation in millfeed remains unchanged. Occasional cars of bran are offered and selling at full ceiling, but no carlot shorts are obtainable. Quotations, ceiling carlots, wheat bran and grey shorts $42.20, sacked, delivered TCP, in mixed cars $1 ton higher.

Toledo: All millfeeds remain at ceiling levels $42.37 ton, f.o.b. Toledo, with demand in excess of supplies.

Cleveland: No change is evident in the feed market. Demand continues to consume the supply. Feed is going mostly to truckers and in mixed cars of flour and feed at ceiling prices. Quotations: spring bran, hard winter bran, standard middlings, flour middlings, and red dog, all $42.99 ton.

Buffalo: The railroad boxcar shortage, which has been the greatest problem to the trade, is showing signs of improvement, but the overall picture still is far from normal. Demand is running far ahead of supplies. Trend is firm. Quotations: all varieties $41.55, straight carlots, f.o.b. Buffalo.

Boston: Demand is steady, especially for immediate shipment, but offerings continue light. Mills are offering bran and middlings in combination with clears. Some sales were transacted on that basis, but the majority of buyers are not interested. Quotations are steady at ceilings. Spring bran, midds., mixed feed, red dog $45.67 @46.17 ton.

Pittsburgh: Demand for millfeeds is excellent, with supplies inadequate. There is no change in price, ceilings on standard middlings, bran, red dog being $44.85. Canadian oats are plentiful and help to relieve the tight millfeed situation. Baby chick season is stimulating trade. Shipments are much behind schedules and no improvement is noted in train or truck deliveries.

Philadelphia: Millfeed is scarce and firm, with demand readily absorbing all offerings. Standard bran, pure spring, hard winter, soft winter, std. midds., flour and red dog, all $44.84@45.34 ton.

Nashville: The demand for millfeed continues, with supplies inadequate. There is no change in prices, which remain at the ceilings. Both bran and shorts are quoted $43.30@44.30 ton, f.o.b. Nashville.

Seattle: The supply is limited; $36.50 ton.

Portland: Mill run, bran, shorts, midds. $36.50 ton.

Ogden: Millfeed trade was steady with everything at the ceiling during the past week. Plants are operating to capacity, with labor shortage the greatest mill problem. Quotations: red bran and mill run, blended, white and midds. $36.30, carload lots, f.o.b. Ogden. Denver prices: $38 ton, ceiling. California prices: $42.08, carlots, f.o.b. San Francisco, with Los Angeles prices up $1, ceiling.

Toronto-Montreal: Production of millfeed is insufficient to cover all domestic demand. Never before has this product been so much wanted. The output is at a record point and nearly all of it is made available to buyers in home markets without fully satisfying these requirements. Millfeed is cheap at ceiling levels and this accounts for its unusual popularity. Quotations, domestic ceiling: bran $29, shorts $30, midds. $33 ton, net cash terms, bags included, mixed or straight cars, Montreal freight basis.

Winnipeg: Demand for millfeed is excellent and practically all supplies from western mills are moving toward eastern Canada. Stocks are sufficient to meet the demand. Quotations: Manitoba and Saskatchewan bran $28, shorts $29; Alberta bran $25.50, shorts $26.50; small lots ex-country elevators and warehouses $3 extra.

Vancouver: The domestic situation is just a shade easier, but only barely so. Western mills are booking only from 15 to 30 days' ahead. The slightly easier tone is due to the fact that livestock and poultry producers, faced with the strictest kind of rationing by dealers, have eased off in their demands, but this slack is pretty well taken up by new customers. Supplies are extremely short here. Prices are unchanged. Cash car quotations: bran $29.80, shorts $30.80, midds. $33.80.

RARE OPPORTUNITY TO PURCHASE

"The Finest Small Mill in Canada"

Now producing 250 bbl. flour per 24-hour day with years of 24-hour operation in sight. Grain storage capacity 92,000 bu. Established 1917; practically all new machinery installed since 1938; new 15-ton high lift dump scale installed in elevator in 1944; Carter combination disc and cylinder milling separator with individual motor. Equipment includes 1 large "Invincible" receiving separator, Carter disc milling separator, 60-bu. Forster scourer and a Carter duo-aspirator; four roll stands include 3—9x30 in. and 1—9x24 in. (Nordyke) and "self contained" Twentieth Century Mill, 1—10-section plan-sifter, Gyro-Whip sifter, 1—22x72 in. purifier, 4 Cyclone dust collectors, newest type Forster bran finisher, Alsop and Novadel bleachers, 2 flour and 1 bran packers, 2 Union Special bag sewing units, one ½-bu. Richardson scale, five 500 to 1,600 lb. Fairbanks portable scales, two Strong-Scott employee elevators; motors and other equipment, all in A-1 condition or new. Excellent operating staff. Because I must sell for reasons of health this is a rare opportunity for the right party. Write F. L. Bishop, owner, Battleford, Sask., Canada.

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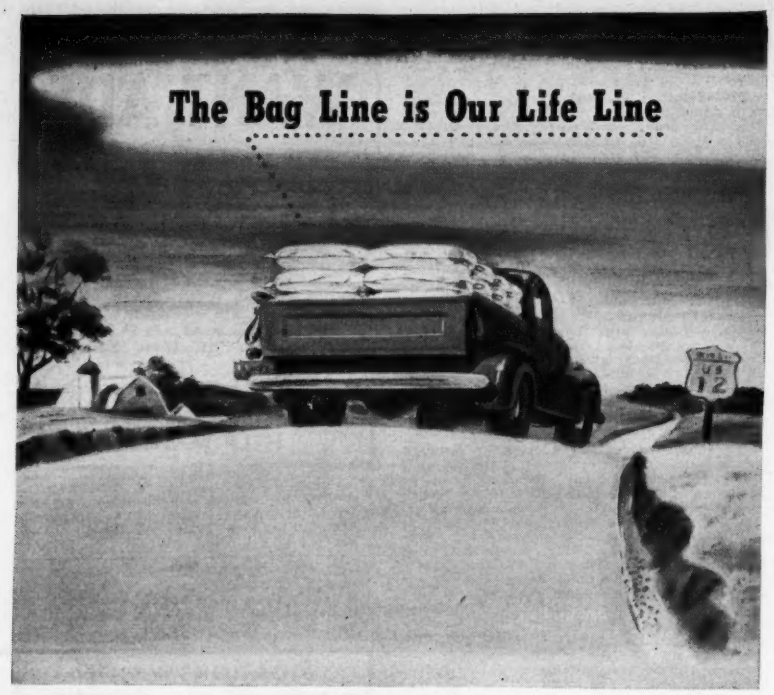

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GRAIN FUTURES—CLOSING PRICES

Closing prices of grain futures at leading markets, in cents per bushel:

WHEAT

	Minneapolis		Chicago		Kansas City		Seattle		Duluth	
	May	July	May	July	May	July	May	July	May	July
April 3	166¼	156⅝	171⅛	158⅝	163⅝	150⅝	154	148	167	167
April 4	167⅜	157⅝	171½	159	164½	151⅝	154	148	167	167
April 5	166¼	156⅜	171⅝	158½	163¼	150⅜	154	148	167	167
April 6	166⅜	156¾	172¼	159⅛	163⅞	151	154	148	167	167
April 7	167⅞	157⅞	173⅛	159¾	164⅞	151⅞	154	148	167	167
April 9	168	158¼	173¼	160	164¾	151⅞	....	....	167	167

	CORN						OATS			
	Minneapolis		Chicago		Kansas City		Chicago		Minneapolis	
	May	July	May	July	May	July	May	July	May	July
April 3	....	....	112⅝	109⅛	....	....	65¼	57⅛	62⅛	57⅛
April 4	....	....	113⅜	109½	....	....	65⅞	57⅝	62¼	57⅜
April 5	....	....	112½	108⅞	....	....	64⅞	56⅞	60⅞	56
April 6	....	....	112⅞	109⅛	....	....	65	57⅛	60¾	55¾
April 7	....	....	113⅝	109⅞	....	....	65½	57⅝	61⅛	56⅜
April 9	....	....	113½	109⅞	....	....	65	56¾	60⅞	55¾

	RYE				FLAXSEED				BARLEY	
	Chicago		Minneapolis		Minneapolis		Duluth		Minneapolis	
	May	July	May	July	May	July	May	July	May	July
April 3	123¼	117¾	118⅝	113	310	....	310	....	107	....
April 4	128	120¾	120⅞	114⅝	310	....	310	....	107	....
April 5	126⅛	119⅝	120⅛	113⅞	310	....	310	....	105	....
April 6	129⅝	122⅞	122⅝	115⅝	310	....	310	....	104	....
April 7	131¾	125⅝	125⅝	119½	310	....	310	....	104	....
April 9	129	124⅜	125¼	120	310	....	310	....	104	....

RYE PRODUCTS

Minneapolis: As was to be expected, rye grain strengthened materially under the influence of lend-lease purchases of flour for Russia and at one time quotations on rye flour were 30c sack higher than a week ago. This advance brought white rye up to and over what mills were asking for short patent wheat flour, upsetting the views of buyers who had been trying to contract at around 25c under mill minimums. Government purchases were said to be around 141,600 bags, scattered among three Minnesota mills. Domestic buyers, naturally, have shown more interest, but continue to hold off on account of prices. The trade, however, will have to buy soon, because their holdings are about exhausted. Pure white rye flour $3.50@3.65 cwt, in cottons, f.o.b. Minneapolis, pure medium $3.40@3.55, pure dark $3.08@3.23.

Cleveland: The recent advance in rye grain has caused very little interest on the part of bakers and jobbers. Those who are not contracted ahead on rye flour have decided to buy as they need it. Quotations: rye flour, white $3.55@3.65, dark $2.90@3.

Philadelphia: Rye flour was firm and higher in sympathy with the strength of rye. A slightly easier feeling developed as the week closed. Offerings were light while demand was fair: white patent $3.70@3.75.

Buffalo: Lack of boxcars is the greatest problem in rye flour trade at this time. Demand is fair. Supplies cannot be moved in quantity desired. Quotations, cottons: white $3.80, medium $3.70, dark $3.30.

Chicago: A few mill agents reported slightly improved business in rye flour last week, but sales were chiefly in one- and two-car lots. Shipping directions were fair. White patent rye $3.39@3.52, medium $3.39 @3.42, dark $2.65@3.09.

St. Louis: Prices advanced 19@21c last week. Sales and shipping instructions were slow. Pure white flour $4, medium $3.90, dark $3.48, rye meal $3.75.

New York: Sharp advances in rye flour cut off buying. Quotations: pure white patents $3.81@3.90.

Pittsburgh: The undertone on rye flour during the past week was fairly strong. Several round lots were sold and scattered sales of smaller amounts closed. Prices were higher. Directions continue good. Lack of boxcars continues the greatest problem of delivery. Rye flour, fancy white $3.82@3.92, medium $3.72@3.82.

Portland: Pure dark rye $3.45, medium dark $3.50, Wisconsin pure straight $4, Wisconsin white patent $4.15.

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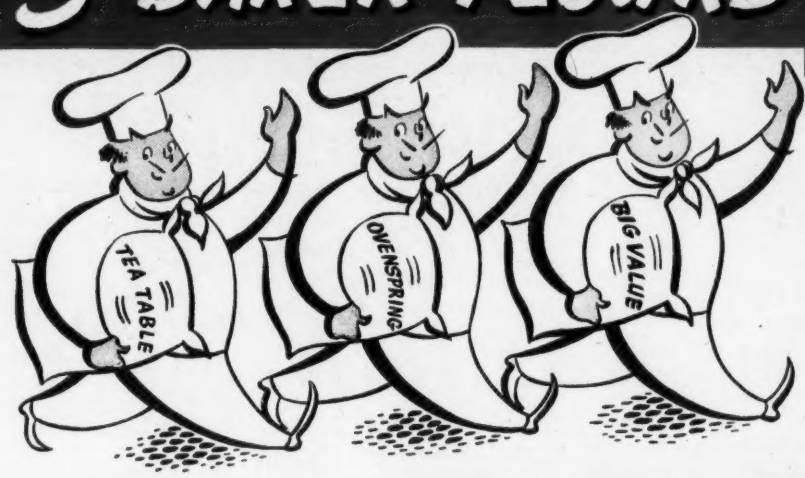

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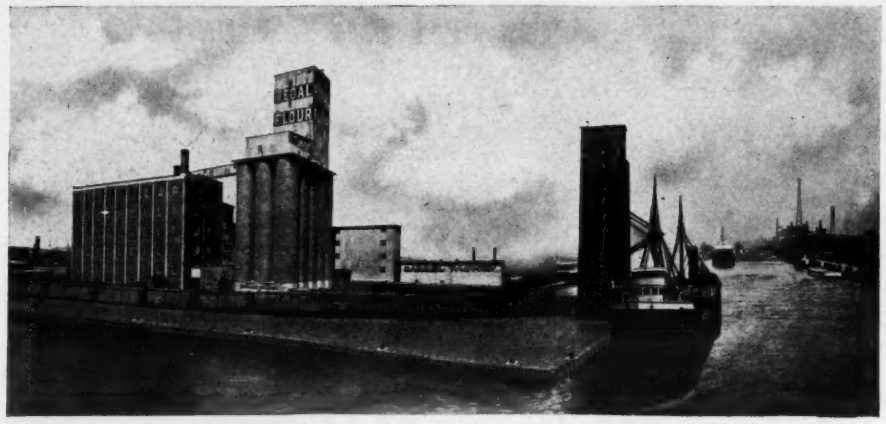

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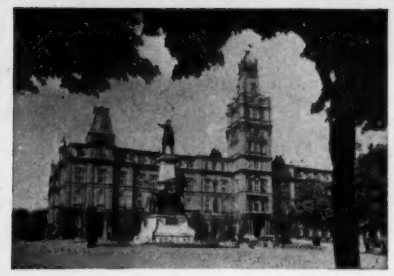

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Advertising

(Continued from page 4.)

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Brand advertising likewise provides the greatest incentive for product development, for to advertise your product successfully, you must advertise it truthfully, and if you say it is good or better—it must be so or your advertising cannot be successful.

If you are selling directly to consumers, of course your salesmen have an opportunity to talk to your customer or prospective customer and so long as no one else is trying to sell that customer, you are all right and you can do business.

However, after you have developed a good business without advertising, what happens when an aggressive competitor willing and able to employ the many effective aids to personal selling decides to go after your market and your customers? Maybe not much at first; but if your competitor's brand advertising is effective and persistent, your volume decreases and that of your competitor increases. Your costs go up; his go down. Your salesmen, depending on personal salesmanship alone, find their percentage of sales to calls decreasing; and your men want you as their sales manager to tell them what to do about it and how to do it. Can you figure out a satisfactory and profitable answer to that question, an answer that will, without the aid of advertising, get that business back from ambitious brand advertising competitors, and insure your salesman, your company and yourself, continued profit and progress?

Those of you who attended the fine sales meetings held in this room during the past 12 months heard, and, I am sure, agree, that this country must produce at least $140,000,000,000 of business in goods and services if industry is to provide 60,000,000 jobs for our returning servicemen and for the workers who are now busy producing the materials of war.

Can salesmen and sales management do this? Without advertising, certainly not. How then? First, by research and engineering, to discover and provide the products that consumers want, or can be taught to want, and will buy, not only in this country, but in every corner of the globe. Then, by a tremendous surge of selling in all its forms, including effective advertising in every language of the world and to the countless millions of people with whom we can soon do business as quickly and easily, so far as distance is concerned, as we do it today with our customers in Texas or California or Pennsylvania.

We will have, after "V" Day, the widest frontiers, the biggest undeveloped markets and the greatest opportunities, also responsibilities, that have ever faced salesmen and advertisers. Can we take advantage of these opportunities? Can we do our share to produce $140,000,000,000 worth of business and 60,000,000 jobs? Can this be done by personal salesmanship alone? No. But it can be done by a combination of personal salesmanship and intelligent, effective and persistent advertising of the new goods and services that will be developed under the free enterprise system and marketed all over the world under the brand names of ambitious profit-minded manufacturers and business men.

COATSWORTH & COOPER LIMITED
C A N D
Grain and Feeds
Exporters
TORONTO, CANADA

TELCO
Grain Shippers
Domestic and Export
TORONTO ELEVATORS LIMITED
Toronto Canada

SINCE 1801
THE LEADING NAME IN CANADIAN FLOUR & CEREAL MILLING —

OGILVIE

Makers of
CANADA'S BEST FLOUR from the WORLD'S FINEST WHEAT
WHEAT THAT IS Carefully SELECTED, Correctly BLENDED AND Really WASHED

Look at These Celebrated Names
OGILVIE FLOUR
ROYAL HOUSEHOLD
GLENORA
FAMOUS
BUFFALO

—and These Famous Cereals
OGILVIE OATS
WHEAT-HEARTS
BLENDIES
TONIK WHEAT GERM
VITA-B WHEAT GERM CEREAL

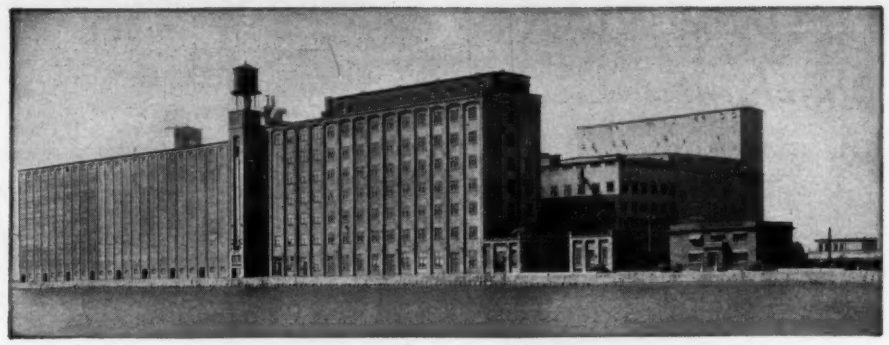
Cable Address
OGILVIE MONTREAL
ALL CODES USED

The OGILVIE FLOUR MILLS COMPANY LIMITED
MONTREAL CANADA

Mills at
MONTREAL FORT WILLIAM
WINNIPEG EDMONTON
MEDICINE HAT

CANADA'S LARGEST FLOUR EXPORTERS

Head Office— Toronto, Ontario



Cable Address— "Mapleshaw," Toronto, Canada

PORT COLBORNE MILLS—CAPACITY 12,000 BBLS. DAILY

Maple Leaf Milling Co. Limited.

EXPORT OFFICES:
TORONTO NEW YORK VANCOUVER

MILLS AT
TORONTO, ONTARIO MEDICINE HAT, ALBERTA PORT COLBORNE, ONTARIO

QUALITY UNIFORMLY MAINTAINED SINCE 1887

Lake of the Woods Milling Co., Limited

Cable Address "HASTINGS" Montreal

ALL CABLE CODES USED

Makers of CANADIAN HARD SPRING WHEAT *Flour*

Owning and Operating Wheat-Receiving Elevators in Manitoba, Saskatchewan and Alberta

Mills at Brantford, Keewatin, Medicine Hat

HEAD OFFICE: MONTREAL WESTERN OFFICE: WINNIPEG

Van Dusen Harrington Co.

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BUSINESS FOUNDED 1852

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ARCHER-DANIELS-MIDLAND COMPANY

J. M. CHILTON, Mgr. Grain Dept.

GRAIN MERCHANTS

Milling Wheat and Coarse Grains

MINNEAPOLIS

MILWAUKEE, WIS.
BUFFALO, N. Y.
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SAN FRANCISCO, CAL.
OMAHA, NEB.
PORTLAND, ORE.
DULUTH, MINN.

"ROCK RIVER" RYE "OLD TIMES" BUCKWHEAT

"BLODGETT'S" RYE

All Grades—From Darkest Dark to the Whitest White
—Specially Milled by the Blodgett Family—Since 1849

FRANK H. BLODGETT, Inc., Janesville, Wisconsin

A new development which greatly extends fermentation tolerance. Provides more time for "cutting over" or giving dough extra punches. If you want a flour which will stand abuse, write or wire

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The Wamego Milling Co.

WAMEGO, KANSAS

Millers of Kansas Hard Wheat Flour

HIGH CLASS BROKERAGE CONNECTIONS DESIRED

"Sasnak Flour"

For Discriminating Eastern Buyers

ENNS MILLING CO., Inman, Kan.

The Williams Bros. Co.

Merchant Millers KENT, OHIO, U. S. A.

Specialists Ohio Winter Wheat Flour

All our wheat is grown on "Western Reserve" and bought from the growers at elevators we own and operate.

"Whitewater Flour"

Ground Where the Best Wheat Is Grown

WHITEWATER FLOUR MILLS CO.
Whitewater, Kansas

THE ROSS MILLING CO.

Choice Quality Flour

Plain and Selfrising

OTTAWA KANSAS

"Hunter's CREAM"

A Kansas Turkey Wheat Flour

that for more than sixty years has stood at the very top of the fine quality list.

The Hunter Milling Co.

Wellington, Kansas

ACME RYE

A HIGH QUALITY WISCONSIN RYE FLOUR

All Grades

FISHER-FALLGATTER MILLING CO.
WAUPACA WISCONSIN

HIGH GLUTEN FLOURS

For Bakers

The Morrison Milling Co.

Denton, Texas

Emphatically Independent

We specialize in designing and engraving for Millers and the Grain Trade

Holland Engraving Co.

Kansas City, Missouri

Victor-Champion-Frost King-Headliner

Family Flour De Luxe

THE CRETE MILLS

CRETE, NEB.

GRIST & GRINS

Father came downstairs and, looking hard at his wife and then at his son, he stormed:

"That boy has taken money from my pocket."

"Henry," she exclaimed, "how can you say that? Why, it might have been me."

"No, my dear," he replied, "it wasn't you. Some was left."

◆ ◆ ◆

Taxi Driver: It's not just the work I enjoy, it's the people I run into.

◆ ◆ ◆

Customer: Why don't you advertise?

Storekeeper: No, sir! I tried it once and it pretty near ruined me.

Customer: How was that?

Storekeeper: People came in here and bought dern near everything I had.

◆ ◆ ◆

She: You'd better watch that arm of yours.

He: Oh, it knows its way around.

◆ ◆ ◆

An Englishman and an American were presented to the potentate of one of the eastern countries. On looking over the Englishman's passport, the dusky monarch said:

"I see, sir, that you are a British subject."

Englishman (twirling his mustache, and with pride): "I am, sir."

Monarch (looking at the American): "And you, sir, are a subject of the United States?"

American (gazing at the monarch in amazement): "Subject, heck! I own part of the United States."

◆ ◆ ◆

A woman who has lost her beauty is as fussy as a man who has to part his hair with a towel.

◆ ◆ ◆

Disguised as a senator's secretary and flashing our social security card we snuck in at a swanky new night club last Saturday night. It fluently reminded us of the gay nineties—the girls were gay and the men were ninety.

◆ ◆ ◆

Summer is the time of year that in winter you wish you could keep your house as warm as.

◆ ◆ ◆

Who knows? Maybe a fish goes home and lies about the size of the bait he stole.

◆ ◆ ◆

A negro preacher in Georgia said in his sermon one Sunday recently: When Gabriel comes, be ready to jump when he toots his horn.

Fat Lady: My goodness, is he comin' in an auto?

◆ ◆ ◆

Roses are red, violets are blue; sugar is sweet—and limited, too.

Milling

WHEAT, RYE, CORN and OATS
FEED WHEAT and FEED BARLEY
Any Grade—Any Quantity
Any Time

BUNGE ELEVATOR CORPORATION

280 NEW CHAMBER OF COMMERCE BUILDING
MINNEAPOLIS, MINNESOTA

"Sweet Cream" "Very Best"

Quality Flours

W. J. JENNISON CO.

MINNEAPOLIS, MINN.

BLACK BROS. FLOUR MILLS

1863-1944

FLOUR 1,000 BBLS.
STOCK FEED 250 TONS

WYMORE • NEBRASKA

King Milling Company

High Grade Michigan Soft Wheat Flour, Plain and Self-Rising

Successful Millers for Fifty Years

LOWELL, MICHIGAN

BLAIR'S Certified FLOUR FEEDS

BLAIR MILLING CO., Atchison, Kans.

MINER-HILLARD MILLING CO.

WILKES-BARRE, PA.

Manufacturers of
Wheat, Rye, Corn and Buckwheat Flours

Hart-Bartlett-Sturtevant Grain Co., Inc.

Line country houses in five states
Terminal houses at Kansas City and St. Joseph

Kansas City, Mo.

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Minneapolis, Minn.

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Standard of the South plus Dependable Service

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PLAIN AND SELF-RISING
Low cost laboratory controlled mill grinding all types of wheat
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OFFICES
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SAPPHIRE FLOUR

Has Extra Bread Making Qualities

The 34 years which have elapsed since the founding of the Montana Flour Mills Company have been the years of the state's development as the third largest wheat producer in the Union, and during this period Montana Hard Wheat has established a national reputation for the quality of the flour which can be made therefrom.

Starting our milling operations with the very beginning of commercial wheat production, we have during these 34 years devoted constant study, the best of mechanical equipment, and intensive laboratory research towards the objective of milling from this fine wheat those qualities which it is recognized as possessing.

It is against this simple background that we modestly claim that SAPPHIRE FLOUR reflects to the utmost the quality of the wheat from which it is milled.

MONTANA FLOUR MILLS CO.

GENERAL OFFICES: GREAT FALLS, MONTANA

"It's the Wheat"
MONTANA SAPPHIRE FLOUR

"We have contributed to the American Bakers' Foundation."

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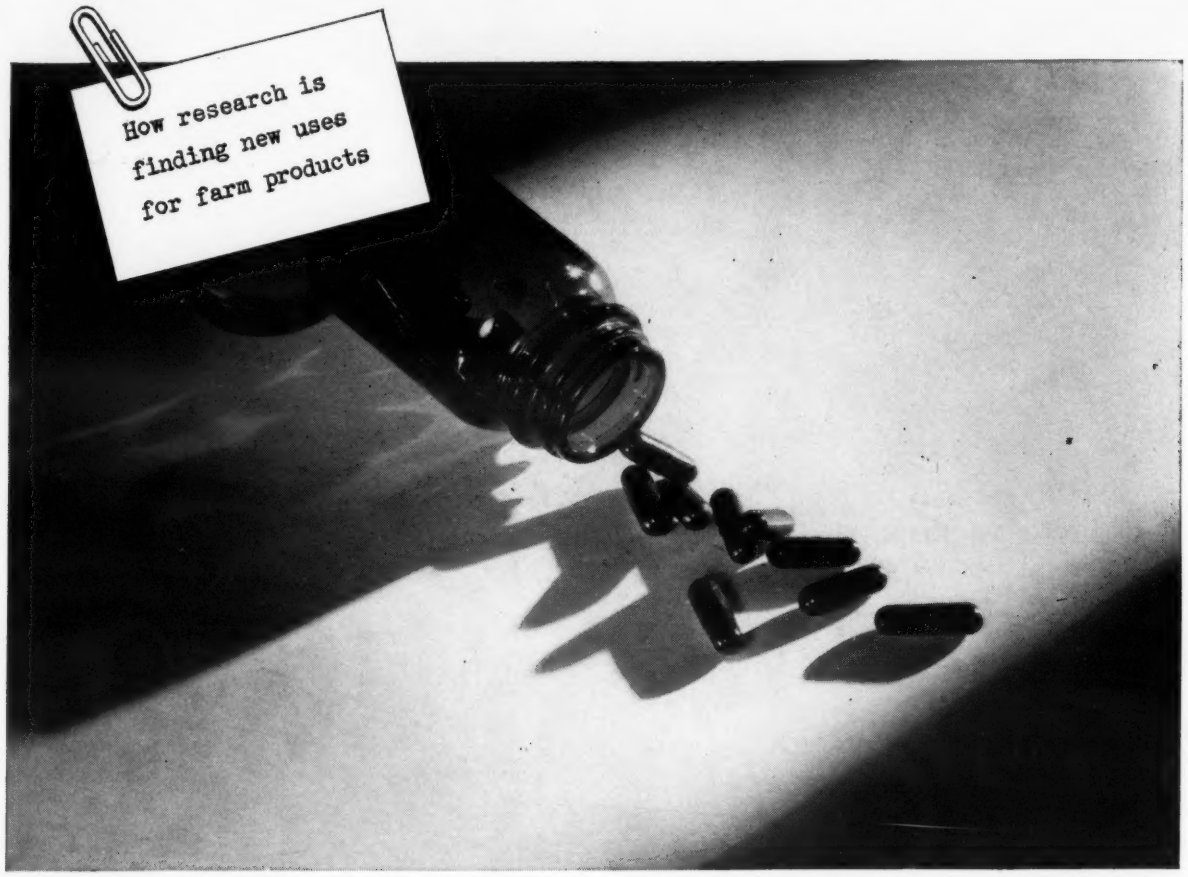

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